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PROGRESSIVE MEDICINE

A QUARTERLY DIGEST OF ADVANCES, DISCOVERIES
AND IMPROVEMENTS

IN THE

MEDICAL AND SURGICAL SCIENCES

EDITED BY

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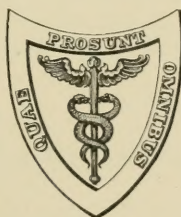
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VOLUME III. SEPTEMBER, 1910.

DISEASES OF THE THORAX AND ITS VISCERA, INCLUDING THE HEART, LUNGS
AND BLOODVESSELS—DERMATOLOGY AND SYPHILIS—OBSTETRICS—
DISEASES OF THE NERVOUS SYSTEM.



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PROGRESSIVE MEDICINE.

SEPTEMBER, 1910.

DISEASES OF THE THORAX AND ITS VISCERA, INCLUDING THE HEART, LUNGS, AND BLOODVESSELS.

By WILLIAM EWART, M.D., F.R.C.P.

TUBERCULOSIS.

IN the province of *etiology* the past year has not brought us the confirmation of the tuberculous bacillemia of which Randle C. Rosenberger had announced the discovery at the close of 1908. The negative findings of so many observers coincide with those of Schroeder and Cotton that it is almost superfluous to enumerate them. Forsyth had reported favorably; but Hewat and Sutherland, of Edinburgh, have, like the rest, failed to find the bacilli, and M. A. Dailey concludes that the appearances described must have been (*a*) attenuated tubercle bacilli, or (*b*) artefacts, or (*c*) extraneous acid-fast bacilli; and that the demonstration by staining methods in the blood is not reliable.

The Streptotrichoses and Tuberculosis. Although a question of advanced bacteriology, this bears upon etiology too prominently to be passed unmentioned. A. G. R. Foulerton's Milroy Lectures, in February, 1910, are ably reviewed in the *Lancet* for March 19. His main propositions are: (1) That under the name of "tuberculosis" there are commonly included infections caused by more than one species of parasite, and (2) that the parasites, generally reputed to be bacilli, or fission fungi, belong in reality to a higher group of organisms, and should, as streptotrichæ, be included with the hyphomycetes, or mould fungi. In 1888, Nocard had previously studied, in a tubercular affection of cattle, a branching bacillus, *Streptothrix nocardii*, acid-fast and infective to guinea-pigs.

As to the questioned unity of tubercular infections, he mentions five distinct types: (1) Tuberculosis occurring in fishes and other cold-

blooded species; (2) avian tuberculosis; (3) tuberculosis of the rat; (4) bovine tuberculosis, and (5) human tuberculosis. These are the types usually recognized, and it is also generally admitted that the parasites in each kind of infection have their own more or less distinctive peculiarities. The question as to whether the five varieties of disease are caused by as many differentiated strains of a common stock, or by as many distinct, but generically allied, species is of little more than academic interest from a purely biological point of view. But he thinks it highly probable that the development of an absolute specificity of these, at any rate closely allied, low forms of life, with their rapid reproduction and quick susceptibility to varying conditions of environment, is merely a matter of time.

With regard to any *intercommunicability* of human and bovine tuberculosis, he believes that while the human adult is susceptible only, or only in any important degree, to infection by parasites from a human source, the child is equally susceptible to infection by either species, "human" or "bovine." The susceptibility of the ox to infection by "human" parasites has, as is well known, been proved by inoculation experiments.

The reviewer remarks that before Foulerton's views can be substantiated, further evidence in regard to latent tuberculosis must be collected. The possibility of infection through the healthy intestinal canal, and the uncertain period during which the pathogenic organism can be retained in the glands, would weaken the assumption that, in the adult, infection is mainly from human sources.

Lymphatic, Pre-pulmonary Tuberculosis, Particularly in Children; and the Pathway of Tubercular Infection. A considerable step has recently been taken in clinical etiology toward an application of our anatomical and pathological data in connection with the lymphatic system, to the purposes of clinical diagnosis. This, it will be seen, has a special bearing upon the question of an earlier recognition of tuberculosis in general, and more especially upon its detection in schools, where school inspection now affords a unique opportunity for the timely search and prevention of the disease in the practically entire juvenile contingent of the whole population. For this we are indebted to a luminous paper by Frederic Wood Jones, of Manchester.

THE PATHWAY OF TUBERCULAR INFECTION. The questions which F. Wood Jones,¹ in his *Anatomical Inquiry into the Pathway of Tubercular Infection*, set himself to answer, were these: "Why does spinal caries so commonly manifest itself in the lower and mid-dorsal regions, and why does phthisis, in the adult, so constantly show itself first above this level, and so very frequently in one definite spot? Why, in children, does tubercular disease so commonly manifest itself as abdominal, or generalized tuberculosis; and why, when it attacks the

¹ Lancet, 1910, vol. i, p. 914.

lungs in children, is it not at all uncommon for it to start as basal phthisis? It must pass through a system which, at varying periods of life, shows such changes as would be likely to alter the route of infection."

"The absorbent system, and particularly the lymphatics of the posterior mediastinum—the thoracic duct and right lymphatic duct—fulfil all these conditions as the pathway of infection in pulmonary and spinal tuberculosis. The thoracic duct is most intimately related to the spinal column from the sixth dorsal vertebra to the second lumbar vertebra, *i. e.*, *precisely those vertebræ the bodies of which are most subject to tubercular infection* (Fig. 1).

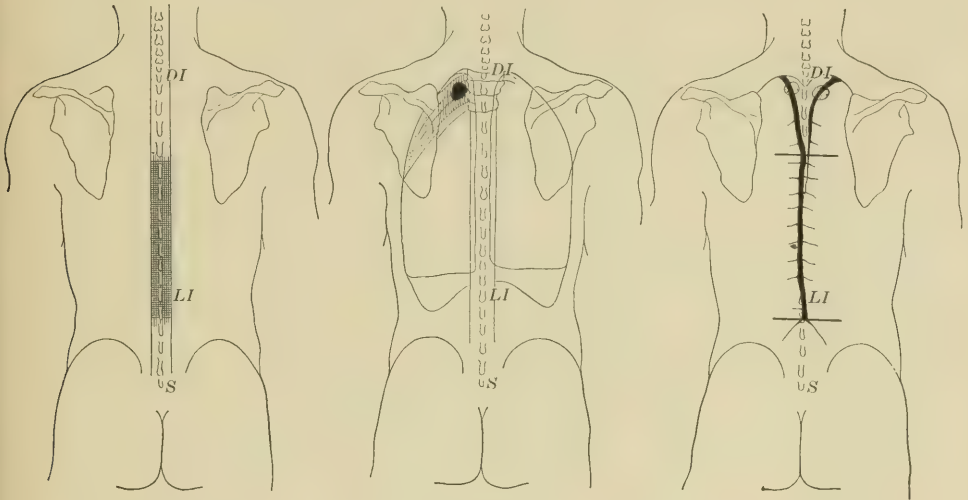


FIG. 1

FIG. 2

FIG. 3

FIG. 1.—The posterior aspect of the trunk, to show the site of election of tubercular disease in cases of caries of the spine.

FIG. 2.—The posterior aspect of the trunk, to show the site of election of tubercular disease in cases of pulmonary phthisis. (After Percy and Kidd. Albutt and Rolleston's "System of Medicine.") The area is indicated on the left side only, but it must be remembered that the corresponding region on the right side (see Fig. 3) is attacked at least as often, and according to many authors even more frequently—possibly because the smaller right duct is more liable to occlusion than the left.

FIG. 3.—The posterior aspect of the trunk, to show the position of the thoracic and right lymphatic ducts, and the coincidence of their situation with that of the sites of election of tubercular disease shown in Figs. 1 and 2.

"Again, the structure most intimately related to the lungs at the site of election of phthisis is the lymphatic channel passing upward and forward over the pleura to join the subclavian veins. In this situation the thoracic duct (or the right lymphatic duct) lies directly upon the pleura, and in more intimate anatomical relation to it than to any other structure in the thorax or neck. So intimate is this relation that the easiest way to find the ducts is to remove the lung from the pleural cavity and then

to look for them through the pleura at the site of election of phthisis. The right lymphatic duct is a larger channel than is at times supposed.

"Another constituent of the lymph channels which run forward over the pleura is the series of vessels from the esophagus itself, and their relation to the apex of the lung is also intimate.

Granted these anatomical possibilities, what is the evidence that tuberculosis of the thoracic duct occurs and might be the primary local infection? Astley Cooper (1789), Cruickshank (1790), and Gendrin (1827) are quoted. But Ponfick went farther; and, in 1882. Stilling first

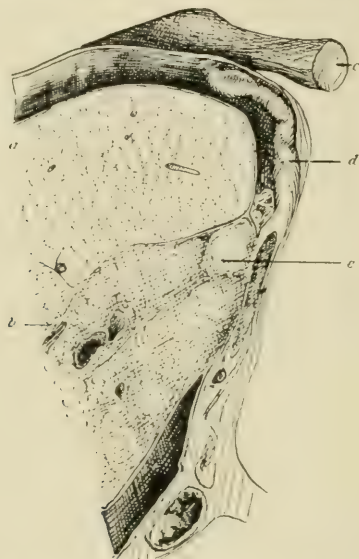


FIG. 4.—Sketch of the dome of the pleura and apex of the left lung from a case of phthisis. The specimen is seen from behind and the lung is shown in section. The tubercular disease is seen to have its apparent origin at the point of adhesion of the diseased thoracic duct, where the pulmonary affection is most intense and from which the disease has obviously spread. *a*, area of lung at extreme apex, practically normal; *b*, area of lung showing disease, but less advanced than in pleural area; *c*, first rib; *d*, diseased thoracic duct seen through pleura but cut obliquely at the pointing line *e*; *e*, maximum intensity of disease of lung at the point of adhesion of diseased duct.

minutely described the tubercles and tuberculous ulcers of the lumen of the duct, "especially on the valves;" and he met with this condition in 5 among 18 subjects dead of "acute tuberculosis." He mostly found it in "elderly people."

Wood Jones gives an illustration showing a diseased apex and a blocked lymphatic duct in contact with it.

Wood further remarks that "if the mesenteric lymphatics most readily carry China ink (and tubercle bacilli) in children, the advent of tuberculous peritonitis is not difficult of explanation; and if the lymphatics of

the diaphragm readily carry infection to the thorax in children, then basal phthisis is easily explained."

The importance of this etiological suggestion is not confined to theory. There are practical sides to it, to which we may refer, after merely pointing out that infections generally work *down stream* rather than up stream, a mechanism which should lead to a secondary implication of the lymphatic ducts rather than to a primary one.

THE IMPORTANCE OF A CLINICAL EXAMINATION OF THE BRONCHO-TRACHEAL GLANDS. Both the theoretical and the practical aspects of enlargements of these glands were opened up long since by Guéneau de Mussy's views on the broncho-adenopathic causation of whooping cough, and, at a later date, in their relation to pulmonary tuberculosis, by Ch. Fernet,¹ who pointed out the association of three signs in early phthisis: (1) A dulness at the apex, (2) a dulness at the seat of the tracheo-bronchial glands either on the right or on the left side of the spine, and (3) an engorgement of the base of the corresponding lung. The second of these seems to be the most important, and has been the least utilized.

In a paper upon *Dorsal Percussion*² I demonstrated that, normally, the fifth dorsal spine is relatively dull upon percussion, with a slight extension of dulness to the right of the tip of the spinous process. Fernet's second sign in reality consists in an intensification of that normal dulness which I believe I am right in identifying with the presence of the infratracheal glands below the resonance of the bifurcating trachea. This points to the necessity of a careful routine examination of all anemic children for any abnormal degree of the "fifth spine dulness," and for its abnormal extension either to the *right* or to the *left of that spine*.

I need not dwell upon the *surgical aspects* of vertebral percussion which will be dealt with in a forthcoming paper. They include, among others, tuberculous glandular abscess and spinal abscess, and early spinal tuberculosis. But, as an excuse for my renewed advocacy of this valuable but neglected method of diagnosis, I may be permitted to call to witness some striking illustrative evidence recently published.

H. H. Mann's³ two cases of "tuberculous mediastinitis," reported in *Guy's Hospital Gazette* for February, are not, perhaps, so remarkable for rarity, since the lesions described are not in themselves uncommon, apart from their unusual mediastinal extension and from the paroxysmal severity of the clinical symptoms, as they are instructive in their varied practical lessons. The most important of these are: (a) That the medical diagnosis and the surgical diagnosis of common and probable affections are capable of being long delayed even when the patients are under observation, and (2) that the method which alone seems to be

¹ Bull. de l'Acad. de Méd., October 11, 1898.

² British Medical Journal, 1899, vol. ii, p. 1168.

³ Lancet, 1910, vol. i, p. 874.

able to trace the early changes is not sufficiently known to have been called to aid, so far as stated, even under stress of danger. I say "alone," because in the first case the *x*-rays, while showing the large mediastinal mass, did not avail to advance the diagnosis; and because the second case was so severe that every method must have been tried to arrive at a conclusion. Had the spine been successfully percussed at the outset, it is probable that the correct diagnosis would have been made then and there, and that the clinical history would have been considerably modified in both cases. (3) Their severity and their fatal tendency are enough to impress upon us the duty of not neglecting the spinal examination either in similar beginnings or in the presence of any general threatenings of puerile tuberculosis.

We are told that in the first patient, a boy, aged eight years, examined on July 8, 1907, after symptoms of bronchitis for two years and attacks of nocturnal dyspnea with wasting for six weeks, "fibrosis of the right lung with some local bronchiectasis were suspected." On July 25, the severity of the paroxysmal dyspnea having greatly increased with symptoms of mediastinal pressure and of respiratory and venous obstruction, and paramanubrial dulness, "mediastinal growth, probably originating in the thymus," was diagnosticated. Examination with the *x*-rays showed *diminished transradiancy of the upper chest*. In the next fortnight the symptoms increased: the face was very edematous, the superficial veins were tortuous and enlarged, the attacks of dyspnea were very urgent, and the pain was severe. The breathing stopped twice, and the house surgeon was about to perform tracheotomy, but the child recovered. The temperature rose in the evening to 101° F. On August 24 the gait was noticed to be peculiar; the knee-jerks were brisk and there was ankle clonus on the right side. The attacks of dyspnea became less urgent. On August 30 the child first complained of pain in the back, and tenderness was found over the last cervical and first two dorsal vertebræ. At the end of September there was kyphosis involving the last cervical and upper three dorsal vertebræ. The child was kept on his back for four months, and then fitted with a poroplastic jacket and jury-mast. Stridor was heard on both sides of the chest as late as May, 1908. The jacket was worn until July, 1909. All signs of active disease disappeared."

The length of this quotation was necessary to justify (1) the inference that a tuberculous bronchial adenopathy due to bronchitis probably preëxisted, and may have accounted, as in many similar cases, for the spasmodic, as distinct from the permanent obstructive, dyspnea; (2) the view that the mediastinitis may have been of the usual glandular abscess type, with a subsequent gradual and latent evacuation through the trachea, and that late vertebral infection via the lymphatics (Wood Jones) may have supervened; (3) or the alternative view that the spinal disease, as *fons et origo*, and the spinal tenderness had existed long before

noted; (4) the conclusion that in either case the fifth spine and its vicinity must have been very dull, for glandular, for spinal, and for mediastinal reasons; and (5) the further conclusion that a systematic routine percussion at the initial examination might have established the medical diagnosis of adenopathy and the surgical diagnosis of spinal disease, with possibly early indications for treatment.

In Mann's second interesting case, that of a boy, aged three years, pain in the back and paraplegia developed in November, 1909, after an attack of scarlet fever beginning on September 23. When admitted, on November 22, his paroxysmal dyspnea was due to a latent abscess causing manubrial and paramanubrial dullness, with cyanosis and edema of the face and neck. On November 29 "the respiration stopped; tracheotomy was performed, and a catheter was passed down into the bronchus without effect. The necropsy showed miliary tubercles in the spleen and liver, and a few tuberculous ulcers in the small bowel. The trachea was flattened and pushed forward by a large mediastinal abscess. The second, third, and fourth dorsal vertebræ were carious." As the lungs and glands are not reported as diseased, this reads like a case of vertebral tuberculosis, perhaps primary, or perhaps secondary, via the thoracic duct, and due to a primary intestinal tuberculosis. In either case, percussion of the spine might have yielded vertebral dullness long before the onset of paraplegia, and the surgical diagnosis of spinal disease might then have been made even in the absence of any kyphosis. It is noteworthy that both these cases appear to have been instances of pre-pulmonary tuberculosis, as the lungs did not present permanent lesions.

PRE-TUBERCULOSIS AND PRE-PULMONARY TUBERCULOSIS IN CHILDREN AND THEIR DIAGNOSIS IN THEIR RELATION TO SCHOOL INSPECTION. It is essential to realize the practical distinction between (*a*) the identification of tuberculosis and (*b*) that of pulmonary tuberculosis. In children, much more than in the adult, the prevailing method begins at the wrong end. Their initial tuberculosis is almost invariably pre-pulmonary in clinical data. As I pointed out in a paper read before the Ilford Division of the British Medical Association in April, 1909, our ideal should be the recognition of the *pre-tubercular* stage; but our practically ideal duty is to identify, where it exists, the *pre-pulmonary tubercular stage*, that of tuberculosis in possession, though not yet in pulmonary possession.

This consideration touches our urgent problem of school inspection. In its all-surpassing object, that of the suppression of tuberculosis, the inspection is a matter not of perfunctory examination, but of the highest skill, for two reasons: (1) The difficulties and the fallacies of pulmonary diagnosis, and (2) the fact that the methods of pulmonary diagnosis are not only apt to be fallacious, but too often are on the wrong scent.

1. These difficulties and fallacies have been pointed out by others whom I might quote, but in this limited space I cannot undertake their systematic discussion.

2. The exclusion or the non-exclusion from school is a medical administrative question, and, therefore, a question of medical opinion. But an exhaustive and so far as possible a *correct diagnosis and report* of the actual condition are questions as to facts. They are a great responsibility upon the inspector, to whom exclusively the examination of the child is intrusted. They must therefore bring into his purview the possibility of a pre-pulmonary tuberculosis, and particularly of the most common form of it, which is the glandular form. That duty weighs heavily upon the minds of Dr. R. W. Philip, of Dr. Allan, and others when they dwell upon the necessity of a searching examination for enlarged glands.

VERTEBRAL PERCUSSION THROUGH THE SPINOUS PROCESSES AS A METHOD OF DIAGNOSIS FOR GLANDULAR AND FOR SPINAL DISEASES. The value of extreme illustrations, such as those contributed by H. C. Mann, which we have discussed, is that they are unequivocal. Cases such as these are not foreign to us. Though they end in the hospital, their beginnings are at the school, and that is our time. School and school inspection are the providential opportunity given to us for remedying in the race the failure of robustness, and for arresting in the individual the beginnings of disease. As regards tuberculosis, it may be said of our material that by definition it is almost invariably in the incipient and, therefore, deceptive stages truly a material for fine diagnosis. Having recognized that fact, let us be consistent in using the best methods of diagnosis, guided by pathology and by practical clinical sense; in short, let us investigate for the right thing in the right way.

As the incidence of glandular tuberculosis prevails over that of the pulmonary form in the proportion of the relative youth of the children, we should expect and we should suspect the presence of tuberculous adenopathy much more frequently than that of phthisis in the average school-fit weaklings. Advanced pulmonary disease is in itself likely to stop, mechanically, the attendance of the unfit.

Malignant infective tuberculous adenopathy, as opposed to non-malignant or scrofulous tuberculous adenopathy, is invariably either mesenteric or bronchial, or else a combination of both. These are clearly the leading lines for our investigation. Therefore, within the thoracic range of our examination our chief care should be to ascertain, if possible, the condition of the infratracheal glands—and they are happily within the reach of practical diagnosis by percussion. In view of the importance of the matter, any relative difficulty that may be inherent to the method can hardly be advanced as a sufficient excuse for its neglect.

General vertebral percussion and “mesenteric” vertebral percussion must also claim attention in their special connection with spinal disease

and with mesenteric disease, respectively. They are not, however, within the scope of these brief remarks.

Diagnosis of Pulmonary Tuberculosis. THE TACTILE AND THE SUBJECTIVE FREMITUS IN THE DIAGNOSIS OF PHTHISIS. S. H. Knopf's paper in the *New York Medical Journal* for January 22, 1910, on "The Subjective Fremitus as a Diagnostic Means and a New Adjuvant in Determining the Localization and Magnitude of the Objective Fremitus in Chest Examinations" will repay perusal. It gives references to his own previous work and to that of Murat¹ and others. Increase of tactile fremitus, varying with the degree of inextension or of consolidation of a pulmonary district, is a well-known and useful physical sign. It generally runs parallel with an increased auscultatory loudness of the voice. It is possible to combine the two observations by keeping the fingers closely applied to the chest, at the side of the chest-piece of the stethoscope or to the chest-piece itself, and thus to receive the tactile vibrations whilst auscultation for the voice sounds is being practised. Knopf, however, makes the important reservation that normally there are local differences in the intrathoracic conduction of the voice sound in different points of the surface of the chest. For instance, a louder fremitus is perceived in many healthy subjects over the right apex, owing to the conformation of the bronchi in that region. This anatomical consideration has to be borne in mind throughout our examinations, as the relation of the bronchial supply underlying the surface is not absolutely the same at any two spots.

A CLASSIFICATION OF CASES OF PULMONARY TUBERCULOSIS has been devised by Wm. R. Huggard,² of Davos, as an advance upon Turban's classification, which recognizes three stages: The first, affecting at most one lobe or two half lobes; the second, affecting at most two lobes slightly, or at most one lobe badly; the third including all cases of greater extent and severity. That classification does not take into account the *intensity* of the affection nor its *duration*.

Huggard's plan is to estimate *numerically*, according to the definitions given, the extent, the intensity, and the duration of the disease, from 1, the lowest grade, to 5, the highest; except that the highest grade of intensity must be taken to range from 5 to 10, so as to include excessively acute or fulminating cases. The sum of these figures will indicate the class in which the case is to be placed.

¹ Un signe nouveau pour le diagnostique precoce, *Gazette hebdomadaire de médecine et de chirurgie*, 5 Mars, 1899.

² *British Medical Journal*, November 1, 1909.

EXTENT.

Amount of Tubercle in the Lung.

- E¹—Not more than $\frac{1}{10}$ of the volume of one lung, whether in one spot (massive) or distributed throughout both lungs (scattered).
 E²—Not more than $\frac{1}{10}$ of the volume of one lung, whether in one spot (massive) or distributed throughout both lungs (scattered).
 E³—Not more than $\frac{1}{3}$ of the volume of one lung, whether in one spot (massive) or distributed throughout both lungs (scattered).
 E⁴—Not more than $\frac{2}{10}$ to $\frac{5}{10}$, or roughly, $\frac{1}{3}$ to $\frac{1}{2}$ of the volume of one lung, whether in one spot (massive) or distributed throughout both lungs (scattered).
 E⁵—Not more than $\frac{6}{10}$ to $\frac{10}{10}$, or roughly, $\frac{2}{3}$ to 1, of the volume of one lung, whether in one spot (massive) or distributed throughout both lungs (scattered).

INTENSITY.

(All the conditions named under one heading need not be present at the same time.)

- I¹—Sluggish, with little or no rise in temperature or other general symptoms. Only slight, if any, hemoptysis. Physical signs of active disease slight, just detectable.
 I²—Slight pyrexia and night sweats; moderate loss of appetite and of strength. Physical signs of moderate activity. Bronchial catarrh, if present, slight in amount and restricted to the area of the tubercle.
 I³—Moderate fever and night sweats; seriously impaired health; loss of strength and weight. Hemoptysis, if present, is followed by continued pyrexia. Physical signs of softening or of cavity formation. Bronchitis, if present, more marked or more diffused than in I². Recent tubercle, if elsewhere than in lungs, very slight.
 I⁴—Grave constitutional disturbance—more pronounced than in I³. Physical sign of greater activity. Bronchitis, if present, more marked or more diffused. Tubercle if present elsewhere more active than in I³.
 I⁵ to I¹⁰—Very serious illness. Physical signs more active still. Bronchial catarrh more pronounced or more diffused. Acute or fulminating phthisis.

DURATION

- | | |
|---|--|
| D ¹ = not over three months. | D ⁴ = not over three years. |
| D ² = not over six months. | D ⁵ = over three years. |
| D ³ = not over one year. | |

CLASSES.

- | | |
|--------------|---------------|
| I = 3 | IV = 10 to 12 |
| II = 4 to 6 | V = 13 to 15 |
| III = 7 to 9 | |

Huggard shows how this plan can be made to work by giving the following examples as a practical illustration:

EXAMPLES OF CLASSES.

- | | |
|--|---|
| E ¹ + I ¹ + D ¹ = 3 = I | E ³ + I ⁵ + D ⁴ = 12 = IV |
| E ² + I ³ + D ¹ = 6 = II | E ⁴ + I ⁴ + D ⁵ = 13 = V |
| E ² + I ² + D ³ = 8 = III | E ² + I ¹⁰ + D ¹ = 13 = V. |

THE RESPIRATORY EXCHANGES IN THE PHTHISICAL. It may be remembered that some years ago Albert Robin¹ made the startling pronouncement that in phthisis pulmonalis the respiratory exchanges, instead of being diminished, were considerably increased in connection with an increased ventilation of the lung, the greater frequency more than making up for the lessened respiratory capacity. These statements were attacked and are now vindicated.

Robin's renewed observations are summed up as follows:

1. Phthisical subjects consume more oxygen and manufacture more carbonic acid per kilogram of body weight and per minute of time than normal individuals. This increase is entirely and wholly due to an enhanced "ventilation" of the lungs—*i. e.*, more air passes into and out of the lungs.

2. There is an increase in the amount of oxygen absorbed by the tissues which does not go to form carbonic acid, but serves to form water in the processes of hydration and the breaking up of nitrogenous matter, and this reduces *pro tanto* the respiratory quotient.

3. There is a diminution of the respiratory capacity, or, rather, of the volume of maximum respiration, whether viewed as an absolute quantity or in relationship to the size of the subject.

"This unexpected increase of respiratory exchanges becomes more marked as the temperature rises, but all the figures were obtained by the observation of apyretic subjects.

"It exists at all stages of the disease. As this progresses, the respiratory capacity diminishes, but the excess of respiratory exchanges is maintained by greater rapidity of breathing right to the very end of life.

"The respiratory exchanges follow pretty closely the oscillations of the disease, falling when there is an improvement, increasing when there is a fresh outburst.

"It is in pulmonary phthisis that the exchanges are most constantly increased. They are also more active in certain non-pulmonary tuberculous lesions, such as pleurisy, peritonitis, etc. But in lesions which display but a slight tendency to generalization, as in tuberculosis of the bones, joints, and skin, the increase is less frequent."

In contrast with Robin's findings it is interesting to note that Tutsch,² in Vienna, bases his new treatment of tuberculosis by "peroxydase" upon an alleged defective oxidation in the lung. The treatment consists in four daily doses of 25 drops of peroxydase on an empty stomach.

Another leading anomaly of metabolism in tuberculosis, described by Robin under the well-known name of *demineralization*, occurs in association with a relative increase in the urinary solids. Both belong to the premonitory and to the initial stages of the pulmonary affection. He regards this increased excretion and diminished assimilation of

¹ Medical Press, May 11, 1910.

² Medical Press and Circular, 1910, p. 500.

solids as characteristic. It can be shown, for instance, that the bones lose their normal proportion of phosphoric acid, lime, and silica.

Among the special features and signs to be identified with a predisposition to tuberculosis, he mentions a reduction of Pignet's *co-efficient of robustness*. This is a formula obtained by subtracting from the height of the individual his weight and his chest circumference, expressed in metric measurements. As in the pre-tubercular and in the early tubercular period, there is an abnormally rapid rate of pulse and of respiration, together with an abnormally low blood pressure, whilst in the "gouty neurotic" the exact opposite prevails, it is possible, according to Robin, to foretell the invasion, and perhaps to forestall it by a timely recourse to suitable measures.

DIAGNOSIS FROM PERSISTENT URINARY ACIDITY. Ten years' study of the urinary acidity in tuberculosis has convinced Malmejac¹ that no other disease produces a like persistence in the acidity of the *kept samples*. In health, the acidity disappears before ten days; in tuberculosis, not before twelve days and much longer, even up to three months or more.

PRE-TUBERCULAR AND PARATUBERCULAR ALBUMINURIA. These are, according to Teissier,² two different and, in some respects, opposite forms of periodical albuminuria. They both possess great significance, as the one is the precursor and herald of the open invasion, while the other, occurring in the offspring of tubercular parents, and accompanied by high tension, indicates, together with some loss of renal permeability and with a slight tendency to renal cirrhosis, a considerable degree of immunization, owing to thorough parental impregnation with toxins. In the subjects of this paratubercular albuminuria, suggestive symptoms may arise; but these are either false alarms only, or mild attacks tending to spontaneous retrogression. Thirty-four out of 100 of his intermittent albuminurics were of tubercular parentage, and of these only six had the ominous pretubercular *cyclic morning type*. All the others were of the hopeful type, and did well.

The features special to the pre-tubercular type are, besides the periodicity in the morning even in orthostatic cases: A highly permeable kidney; a highly toxic urine, scanty and pale in the morning, turbid in the afternoon; a strongly positive phloridzin test for sugar; the absence of a seroreaction, and a normal arterial tension. Teissier argues that the albuminuria results from the destruction of the invading bacilli by the organism, and from the stimulation of the kidney by their products of disintegration. The cessation of the albuminuria would suggest failure of the organism to dispose of the bacilli and their unchecked invasion and activity. This distinction between the two types is therefore of great importance for prognosis, and may be of help in diagnosis.

¹ Presse Médicale, September 22, 1909.

² Semaine Médicale, December 1, 1909.

The Treatment of Pulmonary Tuberculosis. THE RATIONALE OF THE TUBERCULIN TREATMENT, according to J. Citron,¹ is not that of an extraneous protective, but merely of a stimulation of the organism to produce protecting substances. Hence, length of time is the first requisite for that education.

A contrast may perhaps best illustrate that view. A. Schiotz² hopes to *banish the diphtheria bacilli in chronic carriers* by inoculating the throat with a pure staphylococcus culture. In all the cases (about 6) the experiment proved to be a complete success. This is an instance of an imported agent taking direct effect upon the noxious agents, whereas tuberculin acts only indirectly.

THE PSYCHOLOGY OF HESITATION TO ADOPT TUBERCULIN TREATMENT could hardly be more graphically analyzed than by P. K. Pel's³ apology for reserve in the presence of a remedy still upon its trial. There is indeed much to dampen our enthusiasm and to keep us on the watch. We cannot forget the many unaccountable by-effects—such as headache, fever, insomnia, rheumatoid pains, loss of appetite and weight, acceleration of the pulse and general depression, and the chance of acute exacerbations or complications of the tubercular process, or of an individual hypersusceptibility to tuberculin. In itself, the treatment is so restricted, and there are so many contra-indications, that we might well be excused from attempting it until the cliniques, the hospitals, and the sanatoria shall have established its efficacy upon some unassailable evidence.

TUBERCULIN IN PUERILE PRE-PULMONARY TUBERCULOSIS. Engel,⁴ of Düsseldorf, proves conclusively that this is by far the best field for the boons of tuberculin, a treatment for which children show a special tolerance. The method is to accustom the child, while kept in bed, to a large dose; and to keep this up, by systematic interscapular injections, with due regard to the reactions. V. Pirquet's test generally ceases when the child can tolerate 0.01 c.c. tuberculin. *Latent tuberculosis* does not occur, Engel insists. It is only the localization which is occult, and that is generally not pulmonary. He mentions a case, with physical signs indicating apical disease, in which recovery under tuberculin proved that the affection must have been glandular only. When this spreads beyond the glands, the prognosis is much less favorable. An acute tuberculosis in the midst of apparent health is in reality the end of an infection which should have been suspected and tested for.

Some benefit may be looked for in the case of a small and non-progressive pulmonary lesion. But active pulmonary tuberculosis contra-indicates and discredits tuberculin; though mere pyrexia is not in itself

¹ Berliner klin. Wochenschrift, December 20, 1909.

² Ugeskrift f. Laeger, December 9, 1909.

³ Berliner klin. Wochenschrift, September 20, 1909.

⁴ Beitr. z. Klin. d. Tub., Würzburg, xiii, No. 3.

a bar to its use. Suitable subjects, such as he describes, thrive under tuberculin. For instance, in eight infants between three and eight months old, with one exception, the tuberculosis was apparently arrested, and normal growth was well maintained.

SPENGLER'S I. K. TREATMENT. O. Simon's¹ trial of this "active and passive immunization by specific immune blood-cell substances," leads him to state that it shows a certain specific action, that longer observation and more cases are required to decide whether it is thoroughly effective in slight and medium severity of the affection, and that in severe cases it is without any effect.

The I. K. (Immun-Körper) method is reported upon by S. Fuchs-Wolfring² from Spengler's laboratory; Alexander³ records indifferent results in eleven cases of his own.

THE MASSIVE TUBERCULIN TREATMENT described by Camac Wilkinson⁴ in his *Weber-Parkes Prize Essay*, the substance of which he has published in book form, has raised great hopes in proportion to the boldness of the method, which should indeed be well qualified "to kill or cure," and to the remarkable results which he reports from its use. As no collateral observations have yet reached publication from other quarters, our exhaustive review must be omitted in this year's report—with the provisional statement that Wilkinson gives the highest credit to Koch's original therapy, and states that "for many years since these early observations of mine I have been giving large doses of T. E., and more recently still of Old T. and P. T., with most encouraging results. I frequently give 4 grams of T. E.; and if this be not sufficient, it is wise, perhaps, to try other forms, especially P. T. or T. A. My observations in 1901, in the light of later experience, show that T. R. is a very useful remedy in early cases, but may or may not be sufficient to prevent relapses.

THE CONTINUOUS ANTISEPTIC INHALATION (through a Burney Yeo's perforated zinc respirator), as recommended on the strength of many successful results by David B. Lees,⁵ has been well spoken of by trustworthy observers, such as W. H. Willcox and C. Muthu. This is the antiseptic solution which he employs:

R—Acidi carbolici	3ij
Creosoti	3ij
Tinct. iodi	5j
Spiritus ætheris	5j
Spiritus chloroformi	5ij

Of this solution, 6 to 8 drops are poured on the felt of the inhaler every hour during the daytime, and two or three times during the night, if the patient is awake. The method, therefore, claims a fair trial.

¹ Zeits. f. Tub., 1909, Band xv.

² Beit. z. Klin. d. Tuberc., October, 1909.

³ Ibid.

⁴ The Treatment of Consumption, London, 1908; also Pract., February, 1910.

⁵ British Medical Journal, December 11, 1909.

It is perhaps to be regretted that its presentation should have been associated with that of a system of *Physical Signs of Incipient Pulmonary Tuberculosis*, which has called forth some rather acute criticism. Clive Riviere¹ remarks: "Dulness and lessened air entry at the four apices" of the lungs (that is, the apices of the upper and lower lobes), as a sign of incipient pulmonary tuberculosis, imply that at the earliest stages signs may be found in *both* intrascapular regions. Now, it is easy to determine impairment on *one* side (and this is, in my experience, the common find in a fairly early case) by a comparison with the other. But if the percussor travels down each side of the back in the intrascapular region he will find a distinct area of impairment *in the healthy*, extending for about three finger breadths from the scapular spine downward. This is due to the two rhomboid muscles as they cross from the vertebræ to the scapular border, and in a muscular subject the percussion note may be greatly changed. These dull areas in the healthy correspond fairly closely with the common locality of tuberculous deposit in this region, and may readily be taken by a student of Dr. Lees' paper for a double tuberculous lesion confirmatory of some doubtful signs discovered at the apices of the lungs. The likelihood of such a mistake has prompted these remarks. In my own experience the signs appear at the points of election in phthisis in a more gradual sequence than Dr. Lees' paper suggests; and I have not had the good fortune to find them at four separate centres at a really early stage."

It is difficult not to agree with the main drift of these comments. But they do not necessarily invalidate the therapeutic value of the method. Muthu² has improved the inhaler. He also introduces 2½ per cent. of formalin, thus:

R—Formalin (40 per cent.)	m xv
Chloroform	ʒ ss
Menthol	gr. v
Ol. pini	℥ v
Spt. vin. rect.	q. s. ad ʒ iv
Ten drops to be sprinkled about half hour to an hour.	

The strength can be increased to 5 or even 10 per cent. if necessary.

THE ANTISEPTIC TREATMENT BY MERCURY, tried in 33 cases by G. G. Moseley,³ has given him the following results: Marked improvement, 5 (15.15 per cent.); slight improvement, 11 (33.33 per cent.); stationary, 8 (24.24 per cent.); failed, 4 (12.12 per cent.); died, 5 (15.15 per cent.).

On the other hand, Harry Freeman⁴ uses *succinimide of mercury injections*. He employs 0.1 grain with gradual increase, and subsequent

¹ British Medical Journal, January 1, 1910.

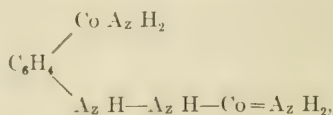
² Ibid., p. 1827.

³ Calif. St. J. of Med., September, 1909.

⁴ New York Medical Journal, 1909, p. 1210.

gradual reduction when the gums or bowels show tenderness, until 30 injections have been given; a second course is given after two weeks' interval. He has had excellent results in the four cases treated, as regards physical signs, temperature, cough, expectoration, night sweats, and considerable increase in weight.

TEMPERATURE REDUCTION BY CRYOGENINE, a semicarbazide of the formula:



has often been obtained by J. E. Gordon, where other antipyretics had failed.¹ He gives full notes of one of his best cases (a girl, aged sixteen) showing striking improvement and a gain of twenty-nine pounds. Although less potent than pyramidon in lowering the temperature, it is the safer remedy.

THE HYDROCHLORIC ACID TREATMENT. J. F. Russell² bases his treatment upon the assumption that "the dietetic cause of the disease is lime starvation." Dilute hydrochloric acid is to be added to milk and eggs, in order to supply it simultaneously with phosphate of lime and casein, to the exclusion of vegetable juice and glycerin. He promises a further report of his results.

THE LABOR CURE which he had witnessed at the Frimley Sanatorium is described and commented upon by M. F. Dumarest³ from the French standpoint. He deplores the fact that the popular prejudice in France against "sweating" should have to be reckoned with in any attempt to secure for the sufferers at his own sanatorium the striking benefits obtained by Paterson.

LATE RETURNS OF SANATORIUM TREATMENT. Köhler's figures in the *Deut. med. Woch.* for June 24, 1909, bear upon an aggregate of 1668 patients. "After two years, over 61 per cent. showed complete earning capacity; after four years, 53.3 per cent.; and after six years, 69.4 per cent. Partial earning capacity was found in 17.5 per cent. after two years; in 14.2 per cent. after four years, and in 7 per cent. after six years. 14.2 per cent. had died by the end of two years; 25.2 per cent. after four years, and 19.4 per cent. after six years. Tuberculosis did not, however, account for all these deaths.

CHLOROFORM VERSUS NITRITES IN HEMOPTYSIS. J. B. Fish,⁴ on the strength of most excellent results in 33 cases, warmly recommends the employment of chloroform as a routine measure in pulmonary hemorrhage. There is no question of the utility of nitroglycerin in a certain

¹ *Lancet*, vol. ii, 1909, p. 1812.

² *Medical Record*, November 27, 1909.

³ *Bull. Méd.*, November 24, 1909.

⁴ *Therapeutic Gazette*, 1910, p. 76.

type of pulmonary hemorrhage set forth in his paper.¹ Pulmonary hemorrhages are there classified as follows: *Type I*: Hemorrhage resulting from the hyperemic condition of the bronchial mucous membrane (capillary hemorrhage). *Type II*: Hemorrhage resulting from the destruction of lung tissue associated with an eroded small or medium-sized vessel or vessels (arterial or venous hemorrhage). *Type III*: Hemorrhage resulting from the rupture of a large bloodvessel.

In Type I, the variety due to congestion, characterized by hemoptysis rather than hemorrhage, where agents designed to bring about a reduction of blood pressure are indicated, nitrites, among them nitroglycerin, are undoubtedly of signal service.

Types II and III, however, where the blood escapes from a ruptured bloodvessel, will not be materially affected by vasodilatation. Here we must act directly upon the heart, with the expressed purpose of reducing the volume of blood sent to the lungs. At the same time we must aim to diminish the respiratory movements. Chloroform combines both these functions in addition to reducing the blood pressure, making it the ideal hemostatic for pulmonary hemorrhage.

RESPIRATION.

The Causes of Absorption of Oxygen by the Lungs. C. Gordon Douglas and J. S. Haldane² make an important preliminary communication upon this question. "Pflüger, Fredericq, and, quite recently, Krogh have brought forward experimental evidence in favor of the *diffusion theory*, while Bohr and Haldane and Lorrain Smith have supported the *secretory theory*, which was originally suggested by Ludwig."

After a brief outline of the research and of the experiments, the authors state: "It is thus evident that, although under normal resting conditions absorption of oxygen occurs only by diffusion, want of oxygen in the tissues of the body brings into play a supplementary secretory activity by which oxygen is *actively absorbed* from the alveolar air into the blood. This process is presumably analogous to that by which oxygen at a partial pressure of sometimes as much as 100 atmospheres above that in the sea water is secreted into the swimming bladder of deep-sea fishes.

"It is satisfactory to find that the results by the carbon monoxide method agree closely with those hitherto obtained by the aerotonometer method. The reasons why Fredericq and Krogh have obtained no evidence in favor of the secretion theory are also evident. Still more satisfactory is it to find that the process of absorption of oxygen by the lungs is regulated, just as is the breathing itself, in accordance with the physiological

¹ Journal of the American Medical Association, March 13, 1909.

² British Medical Journal, May 14, 1910.

requirements of the organism. But for the secretory process the blood would be very incompletely saturated during muscular work, when five or even ten times as much oxygen is absorbed as during rest. During rest, on the other hand, the secretory process is not required, and would be a waste of physiological effort."

The Breathing Crises recently described by J. Pal¹ are regarded by him as an associated central nervous phenomenon connected with accidents in the larger circulation. The cessation of respiration differs from Cheyne-Stokes in its suddenness, and differs also from the two forms of paroxysmal high tension dyspnea, the one resembling cardiac asthma, the other of cerebral causation, which he had previously described. He has met with 3 instances of it, Loeb with 1 and Hoover with 3. In a typical attack there is cessation of breathing, with loss of consciousness, quickly increasing cyanosis, increase of the right heart, twitchings of the muscles, and the patients appear to be dying. In one of Pal's cases the attacks lasted for eight minutes; and in one of Hoover's, twenty minutes. In most of the cases, morphine had been previously administered for the pain; but this was not, he believes, a sufficient explanation. In a case of abdominal vascular crises which he narrates, the attack occurred nearly always after a dose of sodium nitrite which produced a sudden lowering of an abnormally high blood pressure.

The Value of Brauer's Positive-pressure Apparatus was strikingly demonstrated by Rehn² in a partially successful rescue from chloroform death, when artificial respiration and heart massage were also employed. Respiration and, after seventy minutes, the heart's action were restored and kept up for two hours, when the respiration suddenly stopped, though the heart was kept beating for four hours longer. *Pneumothorax* had occurred through a rent, occasioned, but temporarily plugged, by the massaging finger. Among the advantages of Brauer's apparatus are the following: It does away with tracheotomy, affords a measured air supply, and allows the addition of oxygen.

For *Therapeutic Pneumothorax in Phthisis*, Spengler,³ who has had favorable results in 25 out of 40 cases, prefers the Murphy-Brauer technique to that of Forlanini, because it avoids the danger of gas embolism.

Respiration Maintained by Intratracheal Insufflation. The *Medical Record* for March 19, 1910, contains four practical papers upon the application of recent improvements for the successful artificial maintenance of pulmonary aëration. S. J. Meltzer writes on "The Method of Respiration by Intratracheal Insufflation, its Scientific Principle and its Practical Availability in Medicine and Surgery." Willy Meyer dwells upon the "Avoidance of Apparatus Complicating the Operation: A

¹ Wien. med. Woch., November 11, 1909.

² Münch. med. Woch., November 30, 1909.

³ Corresp. Blatt., December 1, 1909.

Paramount Requirement in Thoracic Surgery." Alexis Carrel deals with "Experimental Intrathoracic Surgery by the Meltzer and Auer Method of Intratracheal Insufflation." Charles A. Elsberg describes "The Value of Continuous Intratracheal Insufflation of Air (Meltzer) in Thoracic Surgery, with Description of an Apparatus." These titles are sufficiently explicit to convey an idea of the nature of the methods, of their range of applicability, and of their importance. Auer's principle is that "of a *continuous stream of plain air* delivered into the lower end of the trachea, or into the orifice of one bronchus, and conducted by a tube of appropriate diameter which shall reach at least as far as the bifurcation. The insufflation is to be kept up continuously under a pressure of 10 to 12 mm. of mercury. The tube must leave sufficient lateral space for the returning or expiratory stream. Under these conditions curarized animals are kept alive for considerable periods.

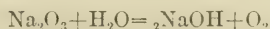


FIG. 5

A Portable Oxygen Generator and Supply, Available for Mountaineering is described by Leonard Hill.¹ The direct inhalation through a mouth-piece may not be suitable in pneumonia, but is unobjectionable in various forms of dyspnea, including mountain sickness.

The breathing bag holds about 15 liters, and ends in a rubber mouth-piece. The bottom of the generator is closed by a screw-cap and asbestos washer, and a piece of wire gauze is interposed between the generator and the bag. The mouth-piece is closed with a screw-clip during the generation of the gas.

The oxygen is generated out of oxylithe—a peroxide of sodium—by contact with water, and there results a solution of caustic soda. Thus:



The caustic soda solution absorbs the exhaled carbonic acid. The oxylithe is sold in flat tins containing ten blocks to the pound. Three

¹ British Medical Journal, vol. ii, 1909, p. 1522.

blocks make a full charge, and the oxygen yielded from this is amply sufficient for fifteen minutes' inhalation.

Hill gives an account of the remarkable relief experienced, in a second expedition in Mexico, by Mr. E. R. Calthrop, who had previously suffered from alarming symptoms.

It is not necessary but better to immerse the generator in water, or hold it under a running tap to cool it during the generation, for the heat produced by the chemical action is considerable. The nose is closed by a soft clip, the mouth-piece is clasped by the lips, and the screw-clip opened. The solution of caustic soda is shaken around the bottom of the bag by the hand that grasps the generator. The solution, of course, must not be shaken too violently, or drops may reach the mouth-piece.



FIG. 6

The subject should expire deeply before inhaling, so as to diminish the dilution of the oxygen by the nitrogen within the lungs. The inhalation proceeds until about two-thirds of the bag has been emptied. It is best to stop then because the oxygen is diluted by the nitrogen given out from the body. The subject, of course, must not draw in any outside air, or let any oxygen escape into the outside air during the inhalation, but keep his lips tight around the mouth-piece and his nose shut. After use, the apparatus is washed out with water and hung up to dry.

G. A. H. Barton¹ has pointed out that the apparatus might be a great boon in emergency anesthetics.

THE PHYSICAL EXAMINATION OF THE CHEST.

"The Normal Auscultatory Differences between the Sides of the Chest." In a short paper upon this subject, Richard C. Cabot² dismisses briefly

¹ British Medical Journal, 1909, vol. ii, p. 1715.

² American Journal of the Medical Sciences, December, 1909, p. 813.

the differential auscultatory peculiarities of the right and of the left apex, which he describes as follows: "It has been clearly recognized, at any rate since Austin Flint's time, and by the great majority of competent practitioners, that the apices of the two lungs differ in a large proportion of healthy persons, *the apex of the right* being more like that which we expect to find in beginning solidification (from any cause) than is the apex of the left. All this is too familiar to need repetition. I wish, however, to call attention to what I believe to be a fairly common difference between the right and the left base posteriorly.

"In a series of 250 healthy cases recently examined with reference to this point, I found the difference to which I allude to be present in 67 per cent. In these cases I noticed that the breathing at the *left base* was notably louder and harsher than that at the right. In the majority of these it had also the quality described by the Germans as 'rough.' I have been unable to see that age, sex, the time of day, or the amount of food in the stomach had any effect upon this phenomenon; yet I found it sometimes present in the morning and absent in the evening, for reasons unknown to me. It seems to be distinctly less common in persons under twenty years of age."

How, then, is the difference to be explained?

It is necessary, in the first place, to refer to the considerable variability which occurs in a large number of individuals, in states of absolute or of relative health, in respect of the respiratory excursion of the right and of the left base of the thorax. It must be stated that in any one person the disparity in question may be a permanent feature, or purely temporary, and apt to alternate from side to side. The causes are various, and it would take too much space to discuss them. Their investigation constitutes, however, a most essential preliminary to the diagnosis of the early stages of pulmonary disease. The whole group may be described as a group of individual peculiarities, congenital or acquired, temporary or permanent, of an extrapulmonary and most commonly of a thoracic nature.

Cabot's observations were presumably confined to individuals free from these exceedingly common adventitious peculiarities. We may venture a few remarks upon the differences which he finds are inherent and essential. Before we can admit that they are incapable of any explanation, we must be quite sure that we have exhausted the list of the differences which are special to the right and to the left thoracic contents. He has referred to the heart, the stomach, and the diaphragm. But we must still consider whether the lungs themselves, which after all are the most likely to be directly concerned with the modifications, as they are primarily concerned with the production of the auscultatory sounds, may not present organic differences adequate to explain the functional differences which he has identified and of which we may assume the correctness. I may be permitted in this connection to refer

to some earlier anatomical studies undertaken with a clinical purpose in connection with the structure of the lung,¹ and which met with the approval of my lamented friend, the late John West Roosevelt.

The differences between the two lungs are based upon the differences in their relation to the heart and its great vessels, the result being the trilobar and eparterial type of Aeby on the right side, the bilobar or hyparterial type on the left side. Because the left bronchus is hyparterial, it has to reach a rather lower level than the right before it bifurcates; and its supply to the upper lobe is given off at a more central spot in the thoracic space. Because the right bronchus is eparterial it runs a less declivous course, and yields its bronchus to the upper lobe before it has reached the centre of the right thoracic space. Important further *intralobar peculiarities* flow from this essential disparity, but before entering into their consideration it is necessary to emphasize the importance of the *lobar peculiarities* which are correlated with the asymmetrical position of the heart.

The leading facts as regards the *lobar formation* are: (1) The existence of three lobes in the right and of only two in the left; (2) the differences in length, in width, and in anteroposterior depth between the right lobes and the left lobes, respectively.

These differences in the three dimensions claim rather closer attention than they obtain in our every-day teaching of clinical anatomy.

As regards the *apices proper* (of the two *upper lobes*), the left apex is conspicuously less broad and also less thick than the right apex, for aortic reasons, and great vessel reasons, and because it is backed by its posterior lobe up to a higher level than in the case on the right (levels of third and fourth dorsal spines, respectively).

From their posterior aspect in the cadaver, the essential differences between the two lungs are disguised from the eye. *From the front* their individual characteristics are obvious:

On the left, there is the great cardiac incisure, which is cut out of the base of the anterior lobe; and in the second place, the cardiac lingula.

On the right, the fulness of the middle lobe is applied like a triangular pad to the corresponding region. But it is also a wedge, with a very thick axillary and a very thin sternal edge.

We may add then to the differences which are essential to the eparterial and hyparterial type the broad differences in configuration which cause the *left* anterior lobe, including its lingula, and also the left posterior lobe, to be both of them longer lobes, narrower lobes, and less thick lobes than the two *right* anterior and the right posterior lobe, respectively.

This clears the way for a better understanding of those anatomical differences to which we have hinted as intralobar. *The intralobar differences are those of the bronchial and of the vascular distribution.*

¹The Bronchi and Pulmonary Bloodvessels: their Anatomy and Nomenclature. London, 1889.

The arrangement of the bronchi and of the bloodvessels must vary in type according to the distance of the surfaces from a central point, such as the first bronchial bifurcation; and also according to the thickness of the pulmonary borders to be supplied with bronchioles.

Relative distance and thinness of any district will be seen to favor *length of bronchioles* or of small bronchial tubes within it. You cannot have a very large bronchial caliber in a long slender district, such as that, for instance, of the lingula; but one must have there a long bronchial conduction, and, therefore, long bronchioles.

If, on the other hand, the supply is for a surface like that of the right mammary region, which is close to the large tubes themselves, the bronchi have to lose size very quickly; and the smaller bronchi that bear the lobular bronchioles are of necessity very short.

These are just two extreme illustrations of the principles which can be worked out for every part of the lungs, and which enable us to describe, as it were, *a priori*, the bronchovascular distribution special to any district.

What has this to say to our clinical problem? A great deal, it would seem. If the bronchioles to a thin part are many and long, they are more likely to reveal themselves to our auscultation by so-called harsh or *bronchiolar respiratory murmur*, as opposed to purely *vesicular soft* breathing sound; and this will be the normal feature of that part; much more if the vicinity to the surface auscultated of larger tubes should occasion a transmission of some of the *blowing breathing* peculiar to the latter.

The Practical Value of Spinal Percussion in the Diagnosis of the Diseases of the Mediastinum. John C. DaCosta, Jr.'s,¹ subject and his conclusions must claim our entire concurrence. But the method, like all others, has its technique and its reservations; and these are always matter for individual opinion and of work.

Da Costa's conclusions bear out the remarks published in the *Lancet*² eleven years ago, and are a first fulfilment of the suggestions there made: "The normal conditions are replaced by dulling influences due especially to the intratracheal glands, in addition to other mediastinal structures, but perhaps distantly also to that of other solids in touch with them. The practical value of an investigation of this dulness in a great variety of intrathoracic diseases, and particularly in scrofulous children and other subjects liable to glandular enlargements, needs only to be mentioned."

He sums up the advantages of spinal percussion in the study of obscure mediastinal lesions in the following words: "It may be concluded that the method is distinctly useful, particularly in that class of cases presenting indefinite pressure symptoms and mural signs, and that it also has a

¹ American Journal of the Medical Sciences, December, 1909, p. 815.

² Vol. ii, 1899, p. 261.

certain corroborative value in the face of a more tangible clinical picture. In the former category belong those very frequent examples of enlarged bronchial and mediastinal glands so frequently consecutive to tuberculosis and to other specific infections in which vague and puzzling pressure symptoms and physical signs are the rule. In such instances the discovery of a dull vertebral strip below the fourth thoracic spine gives a most significant clue, and one ordinarily corroborated by a subsequent x-ray examination. Mediastinal neoplasm, aneurysm of the aortic arch, tumor of the esophagus, atelectasis, consolidation of the lung, and pleural effusion also may encroach backward so as to damp the spinal sonorousness; these lesions should always be taken into account as potential factors of unnatural dullness over the thoracic vertebræ.

It is encouraging to find appreciated at last the clinical opportunity which for almost fourscore years has been a-begging. Avenbrugger, the pioneer of the clinical use of percussion, had hinted from the first in his *Novum Inventum* at possible inferences to be derived, as to the underlying organs, from the sound elicited on percussing bony surfaces. P. A. Piorry, the founder of visceral plexigraphy, wrote a passage in the second edition (1837) of the *Traité de Diagnostic et de Séméiologie* (p. 558, No. 4501), which shows that at that date he claimed to be able to delineate the vertebral column by percussion. But he did not specify the general nature nor the local variations of its percussion note. In his earlier work, *De la Percussion Médiate* (1828), he does not describe the percussion of the spine, although the percussion of the cranium and of the frontal sinuses is referred to.

It is surprising that until the end of the last century no further contribution should have been made; and yet more surprising that after the publication of a map of dorsal percussion the available clinical instrument should have again hung fire.

It may be briefly mentioned that Piorry had not entered into any localizing analysis, but had merely "percussed out" the spine, and pointed out that the spine possesses a general note of its own. He wisely abstained from defining whether the quality of this note partook more of dullness or more of resonance. The particular shade of sound and its name had little importance compared with the main purpose, that of its delimitation by means of sound contrasts. My own percussion differed from his in being essentially analytical. It was directed to individual spinal processes. And it was essentially comparative for the clinical purpose of recognizing at any level the slightest departure from the average percussion value special to each particular vertebra.

The practical usefulness of the inquiry is based upon the principle, which had been prominently brought forward in an earlier paper on "Pleximetric Bones and Viscera,"¹ and in a paper on "Dorsal Percussion,"² that as each vertebra is a perfect pleximeter the percussion of

¹ British Medical Journal, vol. ii, 1899, p. 1168.

its spinous process supplies information concerning the intrathoracic structures in contact with the surfaces of individual vertebrae.

Since that date, except minor corrections, nothing other than confirmatory is to be reported from my own experience on any of the main points described in the map. It is, therefore, to be regretted that von Korányi,¹ who published the results of his own independent observations in 1906, should have been in ignorance of its existence. Instead of adding to the development of the analytical and comparative study already started, his regional description of the spine in five great batches, each made up of heterogeneous percussion elements (on some orchestration principle analogous to that of a blending of colors), is a step backward, and is good labor partly wasted. Much to be regretted also that Da Costa's clinical work should have had the less complete and therefore the less helpful of the two versions of the normal standard to work with.

This account is given by Da Costa: "Von Korányi has mapped out the entire spine, from occiput to coccyx, into five separate zones, each of which, he asserts, furnishes distinctive percussion findings. In brief, these zones, with the sounds therein obtainable with identical percussion technique, are as follows: (1) First to seventh cervical: dulness; (2) first to fourth thoracic: dulness blending below with impaired resonance; (3) fifth to eleventh thoracic: clear resonance; (4) twelfth thoracic to fifth lumbar: dulness progressively diminishing until tympany appears over the last lumbar spine; (5) sacrum and coccyx: tympany."

Da Costa thinks that "of the five different zones outlined but two (the cervical and the thoracic) can be depended upon invariably to show definite findings."

There is doubtless an engaging simplicity in von Korányi's map of the spine—analogueous to that which belonged to the map of Central Africa some years ago. But that simplicity is not at present quite sufficient for the clinical explorer, and should be brought up to date. It may be true that imperfect or bad reasons may have been given to explain some of the peculiarities of percussions which I had so carefully tested. Let us find better reasons, but let the demonstrable facts themselves stand on their own merits.

It is with regret that, apart from the want of accuracy incidental to this coarse grouping, I cannot agree with von Korányi's description of the *regional qualities* ascribed to the percussions. The wide discrepancy between our results as to resonance or dulness of the upper interscapular and of the postcordial regions, for instance, is past any attempt at a compromise.

Some comments may be submitted on the general question as to percussion as a clinical method of investigation. The needs of the beginner have to be regarded, and an easy diagram of a subject has to be devised

¹ Ztsch. f. klin. Med., lx, 295.

for his benefit. In that of spinal percussion, a useful intention underlies von Korányi's diagrammatic division of the entire spine into sections for elementary purposes.

All this is doubtless true, but hardly good enough for finer work. In the studio, the first sketches for juniors are hardly regarded as the *nec plus* to be aimed at by masters. These are days of almost transcendental refinement in microscopy, in radioscopy, in bacteriology, in chemistry—in short, in all clinical methods, except only in physical examination by auscultation and percussion. Here the practical help of the advanced methods of the expert in demonstrating big clinical facts is disregarded because the verdict of the tyro who is asked to put the methods to the test is that he finds them “useless and confusing.” This singular belittling of our percussion opportunities is rather out of date. Some years ago, when the accuracy of a precise percussion was doubted, radioscopy gave the verdict of its absolute confirmation. The same method which gave these accurate results is concerned in those which are not yet utilized, but possibly may be in the future.

As regards the technique, Da Costa's excellent directions for the posture to be adopted by the subject under examination agree with those laid down by von Korányi. It is rather in regard to the percussion itself that some criticism is called for.

Mediate finger percussion is doubtless to be recommended for the sake of its superior value as a method of *palpation*. Let it be practised, but not to the exclusion of the best means of eliciting the sound production which is the main object of our percussion. And it may perhaps be suggested that for that purpose a considerable advantage is lost by interposing the finger. What is wanted is clearly not to lessen the pleximetric facility offered by the vertebra. The great advantage of the tip of the spinous process for the application of our percussion stroke is its almost subcutaneous position. Why should any of this advantage be sacrificed by selecting an imperfect pleximeter compounded of soft as well as of bony material? Why not use a suitable rigid pleximeter such as Sansom's pleximeter, to insure uniform conduction of vibration through solid media, while the finger is used to deliver the stroke? Will he? The percussor is self-committed to a *pleximetric percussion* through the vertebra itself. As he has, *de facto*, waived, for the occasion, any theoretical prejudices he may have entertained against the pleximetric method, let him, at any rate, get the full compensation for this unavoidable sacrifice of his usual principles and practice.

THE PLEURA.

The Genesis of Hydrothorax from Compression of the Pulmonary Veins.
George Fetterolf and H. R. M. Landis¹ admirable paper, adorned by

¹ American Journal of the Medical Sciences, November, 1909.

beautiful illustrations, disproves the old view that the fluid is derived from the parietal pleura, especially the azygos veins. It demonstrates that the fluid comes from the visceral pleura, and that the outpouring is caused, so far as the pressure factor is concerned, by dilated portions of the heart pressing on and partly occluding the pulmonary veins. They point out that the pressure must be from dilatation, as it has long been recognized that hypertrophy of the heart by itself is incapable of producing an effusion, and that dilatation with or without valvular lesions is an essential feature.

We welcome this first instalment as an earnest of more to follow in the study of the pulmonary veins. Its continued neglect has sadly retarded the progress of the clinical pathology as well as of the physiology of the heart.

Blocked Pleurisy, or Pleuresie Bloquee, is the name given by Mosny and Stern¹ to the puzzling condition of *inaspirable effusion*. In some cases the blockage is not absolute, but a little fluid only can be aspirated and no further flow can be obtained. They ascribe this difficulty to some abnormal rigidity of the cavity or pocket containing the fluid. The only remedy, and it is always effectual, is to introduce two needles, one of which is the means of injecting oxygen or nitrogen—or, better still, because of its gradual and not too rapid absorption, simple sterilized air. Some years ago I adopted this procedure, and I found that by providing the needle with a Y-shaped connection it was possible to dispense with a double acupuncture.

Autoserotherapy in Serous Pleural Effusion has already been described in PROGRESSIVE MEDICINE as a method of subcutaneous reinjection of one cubic centimeter of the pleural fluid from the exploratory syringe before the complete withdrawal of the needle (Gilbert and Fede, 1907). The *Lancet*² gives an abstract of Joseph Dodal's³ recent review of the whole subject, including favorable opinions by Nasseti, Schuntgen, Zimmermann, and Marcou, besides his own; and less favorable reports from Szurek and from Koch. The rationale of the mode of action is partly an alleged mechanical stimulation and partly an alleged antitoxic and bactericidal virtue of the serum. In Dodal's seventeen hospital cases, 2 c.c. was the amount injected, and sometimes repeated; and this was almost invariably useful and in some cases markedly so, being more useful in the acute than in the chronic forms. He draws attention to the diuretic influence as well as to the absorptive.

Marcou,⁴ who has made 150 injections in 82 patients, is now trying Gilbert's method in ascites. The best pleural cases are the recent ones with large effusions which are rapidly reabsorbed with less danger of

¹ Presse Médicale, December 11, 1909.

² Vol. i, 1910, p. 808.

³ Wien. med. Woch., February 19.

⁴ Presse Médicale, September 4, 1909.

adhesions and retractions than in the ordinary treatment by evacuation, although the causal affection may continue its course.

Symptoms of "Serum Illness" after Thoracentesis. Some support is afforded to the therapeutic claims which have been made in favor of autoserotherapy by a case reported by Besanon and de Jong,¹ where arthritis, albuminuria, and pyrexia, but no urticarial erythema, occurred twelve days after the removal from the chest of a liter of lemon-colored "lymphocytic" fluid, free from bacilli, but sufficiently toxic to kill in three days two guinea-pigs infected with it subcutaneously. As the diagnosis of rheumatism was negatived by the absence of its normal leukocytosis (10,000 to 15,000) and by a relative leucopenia, they ascribed the symptoms to an absorption of toxins from the serum, the pleural effusion reacting upon the patient like a heterogeneous serum.

The Clinical Control of the Character of Effusions has long been dreamed of as a parallel to our limited control over their quantity. The dream is not altogether utopian, and in connection with the study of viscosity of the blood and of its coagulation, it has taken some slight consistence. R. Chiari and H. Januschke's paper in the *Wien. klin. Woch.* (March 24, 1910) on the "Arrest of Effusions, etc.," deals with an experimental study in that direction on the restraining power of subcutaneous injections of calcium salts on pleural effusion in dogs and guinea-pigs poisoned by sodium iodide, thiosinamin, and diphtheria toxin, and on conjunctival edema in rabbits after instillation of mustard oil. Their results tally with those of Wright in the control of the urticaria of "serum illness," and lead them to suspect that calcium salts may possibly *lessen* the permeability of the vessel walls as well as the fluidity of the blood.

It is interesting to note that the opposite aspect of the same question is dealt with clinically in the treatment of pneumonia by H. von Wyss,² working under Eichhorst. He aims at restoring fluids to the body and at *deconcentrating* the blood, by a different method from that which I described in "The Principles of Treatment of Pneumonia,"³ namely, by the administration, in milk or thin broths, of 10 gm. (150 grains) of salt. Nothing, he believes, better promotes the rinsing of the body with water than this moderate but sufficient supply given in small regular amounts.

Avery's Evacuator,⁴ a simple contrivance on the plan of the "vacuum cleaner," has its chief and many-sided interest for the surgeon. It is the means of securing for him a clean field of operation anywhere; while it is invaluable to the anesthetist for quickly removing any accumulations of mucus from the throat, and also handy for the rhinologist.

The purely medical uses of the instrument are limited to two functions.

¹ Soc. Méd. des Hôp. de Paris, October 29, 1909.

² Zeitsch. f. klin. Med. 1910, lxx (1 and 2).

³ Lancet, vol. i, 1905.

⁴ New York Medical Journal, January 8, 1910.

It can easily be modified by a small attachment into an efficient aspirator, and another terminal fits it for most useful work as a cupping apparatus.

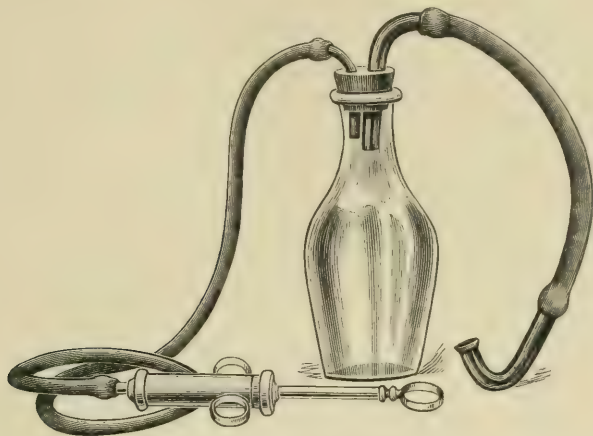


FIG. 7.—Avery's evacuator.

Drainage for Empyema without Resection of Rib. A. J. Colton¹ has practised the drainage of purulent cases "by means of a tube without resection of a rib, whereby the operation is changed from one of a major type to a simple minor one, reducing very much the time required in doing it as well as the dangers accompanying it, thereby considerably lessening the mortality."

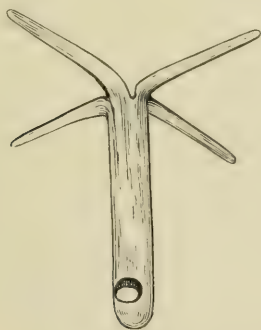


FIG. 8

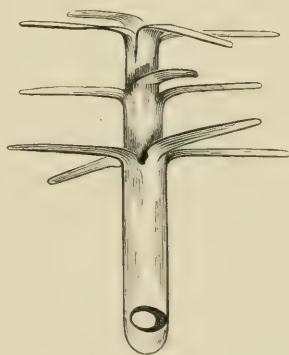


FIG. 9

Colton's empyema tube, in nests of three different sizes.

The empyema tube depicted is made of silver. The average length of time for its use has been about twenty-five days. Colton does not approve of lavage or irrigation.

¹ Journal of the American Medical Association, April 30, 1910.

The Treatment of Empyema, which for many years had been regarded by surgeons as a definitely settled question on the approved lines of a free opening and of free drainage with the help of costal resection, as recommended by Chauncey E. Tennant in the *Annals of Surgery* for January, has once more entered upon another phase of discussion, thanks to the remarkable results recently obtained in Chicago. Murphy has shown that just as a subcutaneous abscess may be evacuated by acupuncture and brought to heal without any incision, by the injection of a suitable disinfectant, it is possible to deal with an empyema by simple aspiration, followed by the injection of a glycerin-formalin solution. On the other hand, Beck has demonstrated the efficiency of a new method of closing sinuses in various parts of the body by injecting a paste made of 33 parts of bismuth and 67 parts of vaseline. Even very chronic sinuses could be readily healed. By extending this process to the chest, cases of very chronic empyema have been cured.

Antiseptic Plugging as a Treatment for Empyema. This is another important method introduced to our notice by Peter Tytler.¹ The purpose of the gauze plug is disinfection and a possibility of closing the wound firmly to prevent collapse of the lung. Tytler describes the method as follows: "The proper treatment of empyema is still a matter of discussion. My last eight cases I have treated by free *incision* of the chest wall, and completely removing the pus, by retracting the ribs, and *raising the patient on his side* so that the opening was in the most dependent position; the wound *was then packed tightly with iodoform gauze*. The plug was kept in for three or four days and then withdrawn, the patient being put in the same position to empty the pleural cavity. On the first occasion, in a favorable case, about a cupful of sanguinolent fluid will be discharged; in one case it was clear serum. The plug is renewed, and, if the case goes well, in another three days there will be about a teaspoonful of discharge, and the wound may then be allowed to heal. If there is still considerable discharge the plug should be renewed.

"This treatment I found successful in cases of two or three weeks' standing. If a case is opened earlier a good result is not certain. In one case the pleural cavity became so fetid that gangrene of the lung was suggested; but after putting in a pinch of powdered potassium permanganate and leaving out the plug, the cavity soon became sweet. These cases prove the existence of a preëxisting lung complication as the cause of empyema. Just as purulent peritonitis is in all cases the result of perforation, so is empyema the result of perforation.

"On account of the possibility of a perforation, it is better to wait two or three weeks until the lesion of the lung is healed before emptying the pus, unless its removal is urgent, when ordinary drainage should be

¹ British Medical Journal, 1910, vol. i, p. 320.

employed." *An old empyema* is very quickly cured by this method, which does away with the mess and the trouble of repeated dressings.

Iodized Chloroform as a Local Disinfectant. In connection with the method of acupuncture and its varied applications, attention may be called to a valuable disinfectant for the skin at the site of the puncture, introduced by Dr. Chessevant,¹ a 1 in 15 solution of iodine in chloroform. This, unlike the alcoholic tincture, possesses the antiseptic and revulsive properties of iodine to the full, without causing pain, sloughing, or sclerosis of the epidermis.

In the Therapeutics of the Thoracic Organs the chief movement of novelty during the last twelvemonth has also occurred in the direction of the lymphatic system. We cannot refrain from mentioning, because the connection is so close with the clinical problems of medicine, the advances which have been published in W. Sampson Handley's² recent Hunterian Lectures on the "Surgery of the Lymphatic System." They are in striking parallel to the advance in etiology, bearing upon diagnosis and treatment, which we owe to Wood Jones.

In the same department, too, we read in the *Semaine Médicale* (March 23, 1910) of a novel operation, the incision and temporary drainage of the thoracic duct, by Max Wilms, for the relief of fat embolism.

This also brings to mind a report of a successful removal of a thrombus from the pulmonary artery by Krüger,³ the third operation of the kind ever performed.

Lastly, in the joint medicosurgical domains of the pleura and of the pericardium, we lack space to describe the progress made by *cardiolysis*. A new prospect is also opened up in the treatment of intrathoracic purulent collections by novel methods, such as Emil G. Beck's⁴ method for curing chronic sinuses, Calvé and Gauvain's⁵ abscess-aspiration method; Schiller's⁶ trypsin ferment injection method; and Bier's⁷ combined hyperemia and ferment method.

THE SPASMODIC RESPIRATORY AFFECTIONS.

Acute Spasmodic Asthma as Evidence of Auto-intoxication. Such is A. Eustis'⁸ theme, reiterated from 1905, when he first called attention to the clinical significance of *indicanuria*, and since then he has made it a practice to include this in the routine examination of patients. He has

¹ Le Monde Médicale, January, 1910; and Lancet, 1910, vol. i, p. 873.

² British Medical Journal, 1910, vol. i, p. 853.

³ Cent. Blatt. f. Chir., 1909, No. 21

⁴ Journal of the American Medical Association, 1909, p. 2060.

⁵ Lancet, March 5, 1910.

⁷ C. R. Ritter, Berl. klin. Woch., July 26, 1909.

⁸ New Orleans Medical and Surgical Journal, August, 1909,

⁶ Ibid.

found evidence of auto-intoxication in every case of asthma examined by him since; and he believes that during the attack there is some toxin in the blood which acts similarly to muscarin, or as a sufficient depressant to cause the reflex stimulation of the constrictor fibers of the vagus. The cases were relieved by diminished nitrogenous diet, by eliminative treatment and hygienic procedures, rather than sedatives.

The Psychic Treatment of Asthma. M. Saenger's monograph (Berlin, 1910) is the latest utterance of the view that besides the series of physical disturbances reflexly influencing the excessive contraction of the bronchioles a large share must be made for the nervous, and, in particular, for the psychic influences, and, above all, for the mental attitude of dread, of hopelessness at the thought of the attack—shall we call it “asthma-phobia?”—and of resulting volitional paralysis. This is the direction in which Saenger believes that we can afford most help to a large proportion of the sufferers, by special attention to the neurotic element in the earlier stages, and to systematic training. His method is for the most part directed to the regulation of the inspiratory movements, the patient's attention being centred upon a system of counting between each act of breathing, or upon blowing, whistling, or humming. The mouth harmonica is a useful aid. The abdominal muscles are to be trained to take a larger share in the respiratory acts. It is also important for the patient to control, by an effort of the will, the tendency to cough.

A recent suggestion by O. Muck¹ appeals to both the physical and the psychical mechanisms. He finds that cold water poured over the back of the neck or a cold douche applied for a few seconds has a decided influence in relieving congested conditions in the nose, and also in bronchial asthma when it is due to a nasal reflex. The result is attributed to the direct action on the vasomotor and respiration centres, but perhaps also to the suggestion conveyed by so impressive a remedy.

The High-frequency Treatment of Asthma. Otto Gunzel² reports that in every asthmatic the high-frequency interrupted current to the vagus, accessorius, phrenic, and sympathetic nerves produces an anesthetic effect, relieves the breathing after a few minutes, and may, after several sittings, terminate the asthma. The same treatment is useful in other pains or diseases of the nerves, such as migraine, intercostal neuralgia, angina pectoris, lumbago, sciatica, and pain in the larynx. The positive electrode should be placed on the lateral triangle of the neck or in the nose.

Various Remedies have recently been suggested. Tivy³ writes: “I prescribe a powder of calomel containing from $\frac{1}{2}$ to 2 grains, according to the habit of the patient, accompanied, of course, by some of the usual antispasmodic remedies, and my experience is that relief is rapidly

¹ Munch. med. Woch., July 20, 1909.

² Med. Klinik, August 8, 1909.

³ British Medical Journal, vol. ii, 1909, p. 882.

obtained, even before purgation takes place. Other cathartic drugs do not seem to have the same effect, or certainly not so rapidly."

Carmalt Jones¹ describes the frequently favorable results obtained with a vaccine which he prepared in Sir A. Wright's laboratory.

Posselt's paper in the *Wien. med. Klinik* (June 13, 1909) may be referred to as a compendium of all modern methods, internal and external, and by inhalation. As to the patent remedies, they are simply combinations of well-known drugs. Tucker's fluid consists of sodium nitrite, atropine (1 in 100) and 1 per cent. cocaine in glycerin and water. Hayes' preparation contains potassium and ammonium iodide.

Marcuse² confirms Muck's advocacy of *cold affusion to the nape*, to check the attack, and for daily use as a preventive.

C. Matthews³ has found a nasal spray of *adrenalin chloride* (1 in 4000 to 1 in 1000) invariably successful.

For Pertussis the latest remedy is the daily injection (subcutaneous or alternating with intramuscular) of a dose varying with ages from 3 to 5 to 10 to 15 c.c. of oleogomenol (20 to 100). It has been introduced by Dr. Rousseau,⁴ who has succeeded in curing all of his numerous cases between the twelfth and the twentieth day.

E. Hönck⁵ ascribes the striking results he has obtained from *abdominal massage* to the sympathy which he believes exists between the abdomen and the tracheobronchial system and its glands.

Functional Pulmonary Disablement with Obsessional Pneophobia, Due to Cardiophrenoptosis. G. Scherb's⁶ case is of singular interest. It is that of an overworked powerful bass cathedral singer, aged fifty-three years, disabled for six years from singing, and afflicted with neurotic checked-breath (I propose the term "pneophobia") and other psychical alarms, since the occurrence of a sudden seizure with intense cardiac pain, followed by symptoms of visceroptosis, phrenoptosis, and cardiopptosis. The case illustrates the extreme psychical consequences liable to follow the anatomical upset which is so often overlooked. The patient recovered his nerves, his voice, and his livelihood through wearing a suitable belt.

There could be no better illustration, too, of the purpose and of the effect of the method recently evolved by a distinguished laryngologist, Scanes Spicer,⁷ of London, "A New Cardinal Principle in the Treatment of Disease, and its Application in Disorders of the Nose, Throat, Voice, and Speech." He is the advocate of "back-breathing," and the sworn

¹ British Medical Journal, 1909, vol. ii, p. 1049.

² Münch. med Woch., 1909, vol. v.

³ British Medical Journal, February 19, 1910.

⁴ Medical Press and Circular, May 10, 1910.

⁵ Forts. d. Med., February 17, 1910.

⁶ Presse Médicale, September 4, 1909.

⁷ Polyclinic, p. 41; Med. Press and Circular, February 9; and Brit. Med. Jour., September 11, 1909; and May 14, 1910.

enemy of "pot-belly breathing," as Major R. F. E. Austin¹ not inaptly terms it.

The "*psychico-postural-respiratory training method*" of Scanes Spicer² is a more systematic development of principles and methods of physical culture studied, taught, and practised before; but never before with so much enthusiasm and with so much ambition, for he expects from it the prevention and possibly the cure of tuberculosis and even of cancer. Cancer, for him, is not due to a specific microbe, but is "a biological syndrome or symptom-complex of threefold origin, namely: (1) Deficient vital energy in the neuron system; (2) auto-intoxication of the blood from portal and general venous stagnation; and (3) excessive persistent local irritation or simulation of epithelial cells which might be of intrinsic, endogenous, or autogenetic origin." The method and its purpose are so good that one is almost tempted to submit for his approval a shorter name, such as "the orthostatic," or, better, "orthodynamic respiratory method," to further its wider diffusion.

The basis of the method is the *erect attitude*, with all the psychism that this implies. The dynamics of it are the avoidance of the undesirable "centripetal action," or descent, of the diaphragm, and the cultivation of its "centrifugal," ascending, rib-raising action, previously recognized by Galen (A. D. 150) and by Duchenne (1868). How this is to be achieved must be studied in the references enumerated. "If the diaphragm works centrifugally, it has not to expend power upon dragging down the thoracic viscera at each in-breath, and exerting traction upon those strong fasciæ which connect the pericardium and roots of the lungs with the inlet of the thorax and the cervical spine, and it has not to waste power in translating the abdominal viscera. One of the great factors in curing neurasthenia is to so use the human machine as to get from it 'optimum efficiency' and not to waste power on unnecessary internal work. Gastropsis is, with the rare exception of a 'dislocated' stomach, only part of a general ptosis of the viscera. It is especially common in those who suffer from affections of the upper air passages.

"In conclusion, the most efficient treatment for uncomplicated ptosis of the viscera is the physical education of the spine, thorax, abdominal wall, and diaphragm to regain and maintain optimum efficiency of the postural and respiratory mechanisms by such measures as I have elsewhere described."

Emphysema. EMPHYSEMA IN GLASSBLOWERS. It is still a current teaching that glassblowers and players on wind instruments are especially liable. Edsall,³ in his paper on "Occupation Diseases," shows that this is incorrect. "The most recent studies of the musicians in the German military bands, and the studies by Prettin and Leibkind,⁴

¹ British Medical Journal, 1909, vol. ii, p. 918.

² Proc. R. Soc. Med., vol. iii, No. 6, p. 119.

³ Journal of the American Medical Association, 1879, liii.

⁴ Münch. med. Woch., 1904.

of glassblowers who had been at this occupation for at least ten years, are directly opposed to this. The latter showed that only 5 of 230 glassblowers had emphysema, and it was probable that in all these cases it was due to other causes than the glassblowing. These observations are concurred in by Schmidt and others. This, then, is apparently a tradition and not a fact. It is also possibly an illustration of the adaptability that tissues frequently exhibit to an extra tax, so long as they are not diseased, though it appears to me that careful observation of these persons shows that the strain comes very much more on the mouth cavity than on the lungs, and the mouth often showed marked results, hernia of cheeks and perhaps dilatation of Steno's duct."

It may be suggested as a comment on Edsall's explanation that this is an instance of the *law of increase* of tissue and of functional strength in any mechanism which is *especially worked and duly rested*, provided always that it is not systematically overworked. The occurrence of emphysema in the small minority is due to their having been relatively overworked, probably owing to some original unfitness for the labor, or to some acquired disqualification through intercurrent disease or accident.

As a further comment, be it said, the lungs and chest are especially and admirably constructed for "strain" as a normal, every-day function. Within reasonable limits, strain, far from being destructive, is most beneficial to the lungs, to the thorax, and to the organism. It does more than fill the chest—it also empties it.

FREUND'S OPERATION. U. Grimaldi and G. Perugini¹ report success in a case of marked emphysema, with a history of attacks of asthma and of acute bronchitis for a year. The perichondrium was separated, and pieces of 1 to 1½ in. long were removed from the right second, third, fourth, and fifth costal cartilages, using a Gigli's saw. Biliary colic and jaundice occurred a few days after the operation, but the patient made a good and rapid recovery. Pain upon moving and using the right arm and shoulder passed off after a few weeks; the cough and dyspnea (which had been marked) passed off rapidly, and nine months after the operation the patient, a soldier, aged thirty-four years, was free from cough.

Since Freund's recent advocacy (renewed after nearly fifty years) of mobilization of the "primary costal rigidity and of the dilated thorax," Hildebrandt's first case was successful. Other successes have since then been published; but in a recent case complicated with active apical tuberculosis and adhesions, dyspnea, and subcutaneous emphysema supervened, and death occurred on the second day.

M. C. Rath's² contribution to the subject aims at an unbiased survey. Referring to Gottstein's case, and to the mention in his paper of ten cases operated upon with more or less marked and lasting success, he hints

¹ Giorn. Int. de Sci. Med., Naples, 1909, xxxi, p. 481.

² Deutsch. Zeitsch. f. Chir., 1909, xcix, 3 to 6.

that other operations have not been heard of, because not equally favorable; some of them perhaps because, as in the phthisical patient of Bardenheuer mentioned above, they may not have been instances of Freund's genuine type. As a fact, the diagnosis is by no means so simple a matter, since the patient in question had been repeatedly examined by the physicians and passed as absolutely typical, with barrel-chest, much restricted movement, much rigidity, and abundant expectoration free from bacilli. He had been operated upon for empyema seventeen years before. At the autopsy: Instead of sclerosis, normal cartilages; instead of emphysema, phthisis with small cavities at both apices, and diffused bronchopneumonic tuberculosis with extensive pleural adhesions. To guard against so serious a mistake, as radioscopy may not differentiate sufficiently, Rath's suggestion is that, under local anesthesia, the real condition of the costal cartilages might be ascertained as an aid to diagnosis and as a preliminary to any surgical interference.

As it strikes the present writer, all that is needed is to ascertain whether the ribs can be made to work passively through a fair range of respiratory excursion. If they do this well, much may be achieved without operation. If, however, they are practically immobilized, then the exploratory inspection is hardly required. But Freund's operation should then be carried out with great circumspection and with every regard to the patient's restricted breathing tissue and power. The new style of breathing has to be developed slowly and strengthened by degrees.

The after-results of the operation will be watched with peculiar interest. F. W. Stranch¹ does not give a very glowing account of them in 3 cases he had examined. In one of them examined with the spirometer before the operation, a subsequent examination showed relatively little gain in the respiratory values.

Bronchiectasis. ABSCESS IN THE BRAIN IN ASSOCIATION WITH PULMONARY DISEASE," was the last of the late G. I. Schorstein's² contributions. In 3700 necropsies at the Brompton Hospital during the years 1882 to 1904 inclusive, and in over 10,000 postmortem examinations at the London Hospital from 1894 to 1904, there were only 19 cases of cerebral abscess associated with pulmonary disease. But he found that *bronchiectasis* was the most frequent antecedent, viz., 14 cases to 3 of empyema, 1 of pulmonary abscess and 1 of emphysema and bronchitis. *The left side of the brain is affected almost in the proportion of 2 to 1.* He could trace no satisfactory explanation for this nor for the remarkable fact that cerebral abscess due to pulmonary disease is almost invariably *solitary* and unassociated with any abscess or infarcts elsewhere, as is the rule with intracardiac and general pyemic infections. The embolic theory does not appear to satisfy the requirements of these etiological problems. Byrom Bramwell³ has recently published a case

¹ Ther. d. Gegenwart, October, 1909.

² Lancet, September 18, 1909.

³ Rev. of Neurology, February, 1910.

and discussed the rarity of the symptom of hemichromatopsia which he observed.

THE TREATMENT OF BRONCHIECTASIS is indeed well planned when it is above all *preventive*, like that which G. Hoppe-Seyler recommends and describes in the *Deut. med. Woch.* (July 15, 1909). "Let bronchiectasis be borne in mind in all cases of bronchitis, especially in the aged;" and we might add, especially in the young.

The preventive treatment has many sides; but he rightly dwells upon the *postural* methods, originally started by Quincke, but carried much farther by others. The subject has been fully treated in our successive reports. But it seems still necessary to insist upon the *continuous postural* method in bad cases, and upon the *continuous nocturnal postural* method, which I have recommended in all cases, when free from any special contra-indications. Our opportunity for this plan is greatest in small children, while it is most limited in age. Any *operative treatment* should be restricted to thoracic mobilization by resection, and should never interfere with the lung itself except as a last resource.

*Colin Campbell's Intratracheal Treatment*¹ continues to give him excellent results. He publishes a specially difficult case. The patient had subluxation of the jaw and was tongue-tied; he also suffered from vomiting dense, ropy mucus caused by swallowing putrid sputum. Treatment was commenced in November, 1908, and from then until now he had had four ounces of a 10 per cent. solution of izal in glycerin. For the past four months there had been no fetor. The discharge had diminished from 30 ounces daily to a dozen small expectorations. The chest expansion had increased from one to three inches, and he could now run 600 yards in two minutes. A cast of the hand showing osteoarthropathy and a radiogram of the lungs were exhibited.

Fetid Bronchitis is a larger subject not much referred to in recent literature. Its systematic study by Professor Robin,² of Paris, is the more welcome. He recognizes three varieties: (1) The simple chronic bronchitic form, with dilatation of the alveoli; (2) Briquet's disease, or "gangrene of the bronchial extremities;" and (3) the bronchopneumonic form. In all of them the treatment should aim at evacuation and disinfection, while the depressing effects have to be combated. Robin employs a mixture which always gives him satisfaction:

R—Iodide of allyl	5j
Hydrofluosilicic acid	5j
Gomenol or eucalyptol	5ij
Decoction of Carragheen moss	5xvi

A large steam spray is used to pulverize this mixture; it is placed about a yard from the patient, who is covered in his bed by a kind of tent made

¹ Med. Press and Circ., February, 1910, p. 202.

² Ibid., April 20, 1910.

with a sheet, beneath which he inhales the medicated vapor. The spray is kept in operation for ten minutes and then withdrawn, but the patient remains in the tent for half an hour. The operation is repeated every three or four hours, night and day.

PULMONARY HEMORRHAGE, BLEEDING, AND LEECHING.

Recurrent Hemoptysis other than of Tuberculous or of Cardiac Origin. This is a subject for closer study, and John Hay's¹ paper supplies interesting cases toward it. In a woman, aged forty-five years, with a history of early rheumatic fever, of double pneumonia, and of frequent attacks of angio-neurotic edema (Quinke) for ten years, the latter had been associated with hematurias and with attacks of hemoptysis and dyspnea. Although there was no purpura, he thinks the case is an additional instance of the link admitted to exist between Henoch's purpura and Quinke's edema.

The other case was totally different, of six years' standing, in a man, aged thirty-two years, who was previously absolutely healthy; no syphilis and no bacilli were to be found.

The attacks of bleeding were usually of a few days' duration, when he would spit up from one to one and a half pints of red, slightly frothy sputum containing clots. Between these attacks of hemoptysis there was neither cough nor expectoration.

Repeated skiagraphy at last detected, during an attack, a half-filled cavity of good size at the centre of the right lower lobe, explaining a basic dulness which had been observed during a febrile attack, with purulent expectoration, and also the rush of blood apt to occur upon stooping. Nevertheless, at the time of this discovery no form of physical examination could identify the cavity. Hay adopts the view that its origin was an old dried pneumonic abscess surrounded by emphysematous lung.

A similar case was published by S. West. "A man, aged forty-four years, who had been in good health and active work until fourteen days before admission to the hospital, was seized with hemoptysis after running for some distance, and since that time it recurred upon the slightest exertion."

At the autopsy both lungs were emphysematous, but in other respects healthy, except that in the *upper part of the lower lobe* of the left lung two small old cavities with fibroid walls were found, and in one of these a *ruptured aneurysm* the size of a cherry. "This case is important, as showing how very limited the disease may be, and how difficult and perhaps impossible it may be to diagnosticate it."

Hemopneumothorax. This is as uncommon as hydro- and pyopneumothorax are relatively familiar occurrences. The wonder is that all

¹ Medical Press and Circular, 1909, p. 341.

pneumothorax should not be associated with hemorrhage. This is due to the ulcerative nature of the perforation. When, however, perforation occurs by incision or by tearing, we should expect some hemorrhage, though not (in the absence of a lesion of any great vessel) any amount of it, provided there was no hemophilia to keep up the oozing. Nevertheless, cases occur in which the volume of the extravasation is considerable, and yet the bleeding point cannot be found. The traumatic cases have their own explanation. Great obscurity attaches to the sudden unexplained seizures in which not only is the pneumothorax, as it were, spontaneous, but in which it is associated with severe intrapleural hemorrhage.

The following is a problematic case of that description, reported by R. Barclay Ness and George A. Allan.¹ A clerk, aged thirty-one years, upon rising from bed on August 27, felt breathless, with some pain and tightness in the left chest and gastric region. Nevertheless, he travelled ninety miles to his home, and resumed work on August 30. On September 3, a similar but worse attack seized him when walking, and he had to take to his bed. Marked signs of left hydropneumothorax were found, together with the usual visceral displacements, but no cardiac abnormalities. The pulse was 108; the temperature ranged from 98° to 101°. On September 8 five ounces of blood, mixed with serum, were removed by aspiration. His condition improved gradually, and on October 20 he went home recovered; three months later he was still well and at work. No definite clue could be found as to the cause. Bacilli could not be detected, although there was a slight positive reaction to von Pirquet's test.

In Biach's² compilation of 918 cases of *pneumothorax* in Vienna, 77.8 per cent. were due to phthisis. Gangrene, empyema, injury, bronchiectasis, and emphysema came next in order; 14 cases (15 per cent.) were due to uncertain causes. In F. de H. Hall's 31 cases in the apparently healthy, including 21 cases collected by S. West,³ some form of strain was the chief cause alleged, and recovery took place within five or six weeks.

As to *hemothorax*, this is usually caused by injury or rupture of thoracic aneurysm; tubercle and malignant disease are regarded as possible causes.

Hemopneumothorax is extremely rare, apart from injury, and little is known of its etiology. Two important cases are quoted by Finlay from the *Clinical Society's Transactions*, vol. xxxiii. In G. N. Pitt's case (p. 95), a youth, aged eighteen years, was seized with pain while walking, and died the next day with eight pints of blood in the pleura and a torn adhesion stretching between the pleura and an emphysematous bulla near the apex. There was no tubercle in this instance. Upon searching

¹ British Medical Journal, 1910, vol. i, p. 744.

² Finlay (Allbutt and Rolleston), vol. v, p. 576.

³ Clin. Soc. Trans., vol. xx, p. 153.

Guy's Hospital Reports, he discovered a case in which an aneurysm had ruptured in a large phthisical cavity. According to Pitt, the pleura deals with the extravasated blood rapidly, and also seems to keep it fluid.

In H. D. Rolleston's case (p. 90) of a man aged twenty-one years, who died in six days, no cause such as hemophilia could be found, and it was suggested that the air might have been derived from the blood by intrapleural negative pressure from irregular respiration. There had been no injury and no previous pulmonary symptoms. At the autopsy, sixty ounces of fluid blood and a few ounces of clot were present in the pleural cavity, but no cause for either the blood or air could be found, although careful search was made. The causation remained unexplained.

In any attempted explanation for a hemorrhage of this sort, we have to exclude the parietal pleura from suspicion, for it is obvious that, although a rent through the filmy visceral layer may be inadequate to contribute much extravasate, any adhesion which may have suffered laceration may contain a relatively large vascular supply from the intercostal circulation. This possible derivation of the blood might be easily traceable upon postmortem examination, and therefore capable of being excluded if absent. The only alternative being hemorrhage from the lung parenchyma itself, we must take it for granted that the pleura must have given way somewhere. But if the rent cannot be discovered, we are forced to admit that considerable hemorrhage may take place through a relatively minute pleural perforation. We are reminded of a somewhat analogous condition, that of hemopericardium by oozing of blood, without visible perforation, from the wall of an intrapericardial aneurysm.

A Physiological Research upon Leeching in Man. P. Emile Weil, the pioneer of the treatment of hemophilia by normal serum injections, which has led to the varied applications of the idea which have followed, and G. Boye have recently contributed an epoch-making paper in the *Semaine Médicale* (September 8, 1909) on the merits of leeching. Extracts of leeches and of fleas have long been known to physiologists as local restrainers of coagulation, but the clinical deduction had never been clearly drawn. I had postponed—at the time of my publication of "The Principles of Treatment of Pneumonia,"¹ and in view of a long-delayed paper on bloodletting still to be published—giving expression to this intimate suspicion as the reason for my advocacy of *immediate leeching in all cases of pneumonia and not of resection*. Not only can leeching afford a continuous after-flow far in excess of the one or two drachms ingested by the leech—in Ginardet's² reported instance two leeches yielded a total loss of 37 ounces of blood—it does much more than this, with the result that in pneumonia consolidation

¹ *Lancet*, January 21, 1905; *Folia Therap.*, October, 1907, and January, 1908.

² *Thèse de Lausanne*, 1908.

can be prevented, or aborted at its onset, or if not too far solidified, softened down again and absorbed.

Meanwhile, Weil's publication has intervened, and has afforded strong support to these inferences, and an entirely independent experimental basis for the explanation of my published clinical observations in pneumonia. These observations will, it is hoped, cease to be isolated, and become at last of general avail for the safety of our patients.

According to Weil's research, "leeches seem to introduce into the organism something which induces an acute, transient, local hemophilia resembling in many respects true general hemophilia, such as is induced in rabbits by intravenous injections of extract of leeches. The blood in the region is rendered incoagulable and the leech-hemorrhage persists until an amount of blood may be lost comparable to that of a considerable venesection. Wet cups, on the other hand, have no such action on the composition of the blood. When a general bloodletting is desired, leeches should be given the preference, he declares, even over venesection, unless promptly vigorous action is required, as there is no general or local disturbances from them, and the minute wound they form is never accompanied by infection."

I would go farther than this, on the evidence of the clinical experiment of pneumonia. I have derived from the latter the inference that the gift from the leeches is not merely a local gift, but a gift to the entire circulating blood. For that reason I have not sought, in the ordinary cases, to secure any abundant hemorrhage. Why should this be inflicted upon an exhausted patient but to secure for the blood the *leech-inoculation*, a process which ceases when the leech drops off, and the results of which would only be minimized by letting out any more of the inoculated blood? I regard general venesection as an indefensible method (though doubtless in given cases it may be better than no blood-let), but an *initial leeching* as a life-saving remedy. I am glad to find Weil suggesting its adoption as a possible help in "acute pulmonary congestion."

At the same time we must bear in mind that *loss of blood per se, as in simple venesection*, is now known, thanks to E. W. Ainley Walker and Professor Dreyer¹ (and this has also been confirmed by Schroeder), to act "just as a second bacterial injection would," in "causing a considerable further increase in the specific agglutinating power." This fact must, of course, claim our future clinical consideration. We may mention in this connection a case in which venesection was manifestly beneficial.

Acute Pulmonary Edema of Pneumococcus Causation. An instance of this kind, which was free from any other manifestations, is reported and commented upon as unique by Georges Guillain and Guy Laroche²

¹ Jour. of Path. and Bact., 1909, vol. xiv, p. 30; British Medical Journal, 1910, vol. i, p. 233.

² Lancet, 1910, vol. i, p. 807.

at the *Société Médicale des Hôpitaux* on February 25. The chief features were the abrupt suddenness and intensity of the dyspnea, the low temperature (97.5° F.), the relief afforded by bleeding to the extent of 600 grams, and the expectoration next day of some rusty sputum charged with pneumococci. They consider that this undescribed form is, practically speaking, an abortive pneumonia, with possibly a small latent central nucleus, the edema being a defensive reaction against the pneumococcus.

The following are stated to be the previously known clinical forms of pneumococcus pulmonary edema: (1) *Agonal pulmonary edema* is a generalized edema of the lungs which occurs at the termination of grave pneumonia. (2) In the course of pneumonia a crisis of *acute suffocating pulmonary edema* may occur; it is often associated with cardiac failure. Death is the usual termination, but sometimes the expectoration of frothy fluid leads to recovery. (3) Merklen and Pouliot have called attention to an *acute pulmonary edema of pneumonic origin* which occurs in the subjects of *heart disease*. (4) After various pulmonary infections, *subacute pulmonary edema* may occur. The signs and symptoms are milder than in acute pulmonary edema: There are only some large bubbling and some fine subcrepitant rales. Abundant albuminous expectoration continues for two or three weeks and the pneumococcus is found.

To the chief objection which might be raised against keeping the blood fluid, or liquefying the beginning consolidation, namely, that it mobilizes a vast number of pneumococci as possible bearers of varied possible complications throughout the body, I have given theoretical and practical consideration. *Sound theory* tells us that in presence of a dangerous infection the supreme remedy is to restore physiological life where it has been suspended, to make lungs breathe again which had lost breathing power, and through them to restore fighting power to the prostrate organism. *Experience* has taught me that the patient is surprisingly better at the end of the first day's treatment, and with that result I am content.

Lastly as regards possible complications, it will be agreed that none of them (with the exception, perhaps, of meningitis, fortunately rare) neither pneumococcic pleurisy, nor empyema, nor peritonitis, nor arthritis can compare, in respect to their fatality, with pneumonic consolidation. Even if it could be alleged that some one of them must follow, it would be unpractical not to substitute for a dangerous affection another which was free from essential risks to life.

Hirudin, an Extract of Leeches, is stated by Engelmann and Stade¹ to delay the coagulation of human blood. Experimentally, its simultaneous or previous injection prevents the fatal effect of an intravenous injection of the expressed juice of the placenta. Clinically, they report that it

¹ Münch. med. Woch., October 26, 1909.

seems to have the power of arresting the convulsions of eclampsia, which are supposed to be due to multiple thrombosis.

A New Artificial Leech. It is opportune to refer at this place to A. M. MacWhinnie's¹ paper, where he gives a description of his artificial leech. It is especially intended for ophthalmic practice, yet its merits might clearly be available in any situation. The appended illustration is sufficiently explanatory for our purpose, but the paper itself will be interesting reading.

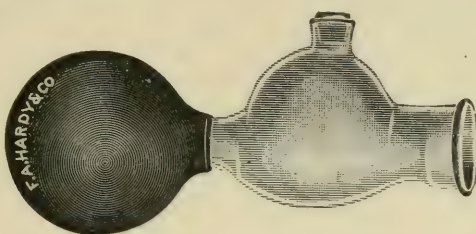


FIG. 10.—MacWhinnie's artificial leech.

Venesection by Aspiration. A new idea of a brilliant simplicity is supplied by Chadzynski.² As we can perform intravenous injections, and aspirations of blood for diagnosis, why not also therapeutic aspirations? In this ingenious method a mere puncture replaces the troublesome and often unsuccessful incision, and all its attendant complications so alarming to nervous patients and their friends. The syringe can be emptied into a more suitable and properly graduated receiver, for accurate measurement. Another great advantage is the very gradual removal of the blood, and the opportunity this affords us for forming a deliberate judgment as to the effect produced upon the patient, and the desirability of stopping or of renewing it. Again, it is a great boon to the patient to be relieved of the cumbersome dressings, and of all chance of any leakage.

THE HEART AND CIRCULATION.

Physical Examination. ORTHODIAGRAPHY IN THE STUDY OF THE HEART AND GREAT VESSELS. This is a subject of which the importance and far-reaching possibilities are only beginning to dawn upon the profession. The orthodiagraph is an apparatus yielding the *x*-ray shadows of objects free from their usual enlargement due to divergence of the rays, while affording the observer every facility for taking an accurate tracing of their true outline on a screen.

The paper by Thomas H. Claytor and Walter H. Merrill³ gives a good

¹ New York Medical Journal, 1909, p. 1121.

² Journ. des Prat., November 6, 1909.

³ American Journal of the Medical Sciences, October, 1909.

description of the instrument and of its technique, to which we must refer the reader. They point out that "while orthodiagraphy should not be looked upon in any way as a substitute for the other well-known methods of examination of the heart and great vessels, it is, at the same time, a valuable aid. It can be used to make fairly accurate outlines and measurements of the heart and great vessels, thus enabling us to make comparisons with the normal, or with subsequent diagrams of the said case. The use of the orthodiagraph may also serve to prove whether or not the size of the heart is influenced to any appreciable degree by a single effort of exertion, or by a single therapeutic or gymnastic treatment."

Their laborious examination of a large series of cases for the determination of the normal size of the heart, and their interesting conclusion that the *size of the heart depends more upon the body weight than upon the body height* deserves closer attention than can here be bestowed upon them.

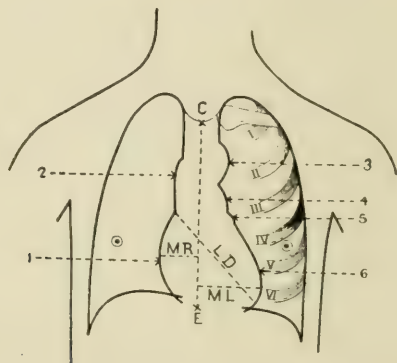


FIG. 11.—Orthodiagram of the normal heart.

The most useful feature of the paper is the reproduction of typical orthodiagrams of the abnormal configuration of the heart in various forms of heart disease, as well as of the configuration of the normal heart. As the latter is indispensable for an intelligent reading of the pathological orthodiagrams, it should be taken first. The authors describe its appearances as follows: "The heart's silhouette, when thus observed, consists of a series of curves, two upon the right and four upon the left side (Fig. 11). Upon the right, rising from the dark shadow of the liver, may be seen the 'right auricular curve' (1), which is formed entirely by the right auricle. Above this is the 'curve of the great vessels' (2), formed by the descending cava or the aorta (in our experience this shadow is more often seen as a straight line). On the left, from above downward, is the 'aortic curve' (3), formed by the arch of the aorta and its descending limb; below this is the 'pulmonary curve' (4), formed by the pulmonary artery as it passes beneath the aortic arch. The next curve, the 'left auricular' (5), is in our experience only exceptionally

observed. It is produced in normal cases by the left auricular appendix, as only in abnormal conditions of the heart does the left auricle itself appear. The lowermost curve is the 'left ventricular' (6), and is formed by the left ventricle."

THE FORMS OF THE HEART'S SILHOUETTE IN DIFFERENT HEART AFFECTIONS are displayed in a series of illustrations. As the purpose of this article is merely to call attention to the value of the method and of its results, and to the excellent work achieved by the authors, it will suffice if we reproduce four of the illustrations, selecting the most typical samples.

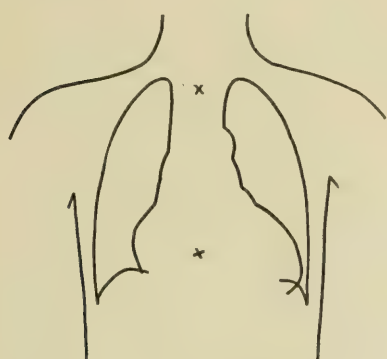
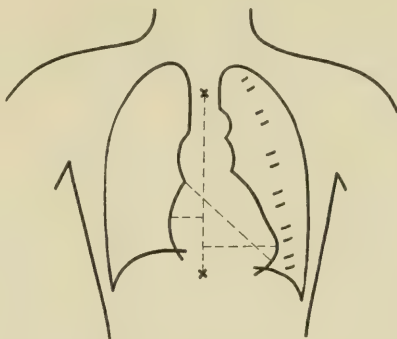


FIG. 12.—Orthodiagram of aortic insufficiency.



Röntgen Ray Laboratory, Corfield Memorial Hospital, Washington, D. C.

FIG. 13.—Orthodiagram of mitral stenosis.

"It may be seen from Fig. 12 that in *aortic insufficiency* the position of the heart is quite oblique, or rather foot-shaped; both diameters are greatly increased; the curve of the great vessels is more prominent, probably because of increased blood pressure in the ascending limb of the arch of the aorta, or because of a dilatation of this section. The right auricular curve is prominent; the pulmonary curve is bulging; the left auricular curve is but faintly visible.

"Of *pure aortic stenosis* we have no example, but the changes in contour are said to resemble very closely those of aortic insufficiency, only they are of less degree. The apex is more rounded, due to its increased breadth from the primary hypertrophy of the left ventricle.

"Fig. 13 is from a case of *pure mitral stenosis*. The figure of the heart is more upright than in that of aortic disease; the curve of the great vessels is more pronounced than in the normal, and this we have observed in every case of mitral stenosis thus far examined by us. There is a decided bulging of the left auricular curve, due to the dilatation and hypertrophy of this chamber of the heart. The left ventricular curve is relatively small, as might be expected."

"Fig. 14 is from a case of *double mitral disease*. The right auricular curve is marked, as is that of the great vessels; the pulmonary curve is

bulging, and there is a decided prominence over the region of the left auricle, although it cannot be distinguished from the bulging curve of the left ventricle. Lastly, Fig. 15 shows a *large aneurysm of the aorta*."

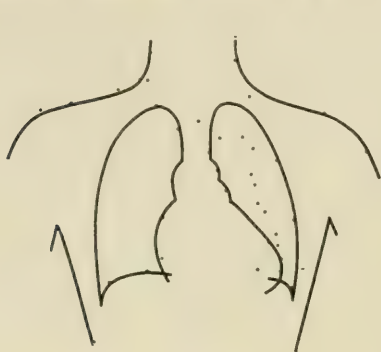


FIG. 14.—Orthodiagram of mitral insufficiency and stenosis.

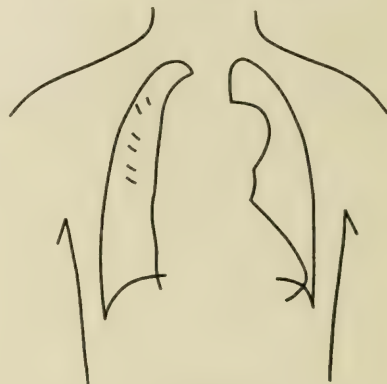


FIG. 15.—Orthodiagram of thoracic aneurysm.

THE EXAMINATION OF THE HEART AND PHYSICAL SIGNS. *The Determination of the Cardiac Apex Beat* has been closely studied by Hughes Dayton.¹ We can entirely agree with his opinion "that the most valuable clinical method of localizing the cardiac apex is the palpation of its impulse when this can be detected in an interspace. The apex beat should be considered as *the point farthest downward and to the left at which a distinct forward thrust of the heart can be felt*. The clinical apex so located, being close to the anatomical apex, is of real value in estimating the size or relative position of the heart. Because of the influence of posture upon the area of relative cardiac dulness, and upon the situation of the apex beat, it is advisable, for comparison with subsequent observations, to record whether the patient was examined in the erect or in the dorsal recumbent position."

Dayton believes that "by careful palpation, with a proper degree of pressure, the limit of the clinical cardiac apex (to the left) can often be distinguished as definitely as the edge of an enlarged spleen, provided it lies in an interspace and not behind a rib. We must acknowledge that the anatomical apex, formed by the tip of the left ventricle, being situated in a plane posterior to that of the right ventricle, comes into direct contact with the thoracic wall only when its apex is situated far enough to the left to strike the lateral wall of the chest."

In view of these difficulties, familiar to all clinicians, I have for many years used a simple method of palpation which may be described in a few words.

The method consists in approaching the apex beat, not from the precordium, but from the left axillary base. The observer's right hand,

¹ American Journal of the Medical Sciences, October, 1909.

as he stands on the patient's right side is applied to that region, with the fingers parallel to the ribs. The pad of the forefinger (or of the middle finger) is then pressed into the fifth interspace, and drawn along that space toward the heart's area, until an indistinct feeling of pulsation gives the first warning that it has reached the vicinity of the heart. The same digital exploration is now started afresh with more attentive palpation. In the axillary region, where nothing but yielding lung tissue underlies the intercostal space, the finger pad can be pressed deeply enough into the latter to satisfy one's self as to the complete absence of any pulsation. The same firm pressure is to be maintained as the finger is carried forward, while the latter assumes a scooping action with slight flexion at the last phalangeal joint. Its palpating surface is in this way directed so as to run up against the deep surface of the apex, namely, that facing the axilla; and, provided the pressure is sufficiently deep, it will hitch up against the apex.

In this position an exact palpation of the position of the apex can be made by the tip of the finger. On its right side the finger tips have control over the apex, which it can actually push; and on its left side it perceives with equal certainty that on that side there is no pulsation whatever to be felt.

Apparent versus Genuine Increase in the Size of the Heart is the question which underlies a protracted paper war, waged in vol. ii, 1909, of the *British Medical Journal*, in connection with Clive Riviere's paper "A Natural Experiment in Cardiac Strain." The first point is to ascertain whether there is any genuine enlargement, and we can only say that to do so reliably by means of physical signs is a matter of considerable technical "expertise," inasmuch as our students have hitherto been taught *ex libro* the most misleading data as to the outlining of the actual size of the heart. The second point, should there be any genuine difference above the average, is to assess any such difference as an individual peculiarity, or else as a pathological condition, as a temporary or else as a permanent abnormality, as a merely compensatory or else as a trophic change, and all this is even more difficult, and truly a most intricate clinical problem.

Increased Viscosity of the defibrinated blood, it is suggested by C. Rubino,¹ might be utilized as an early sign of *threatened failure* of the heart, as he finds it to be one of the earliest indications of the condition.

Bachmann² finds the viscosity increased in pneumonia, decreased in typhoid, while in tuberculosis it tends to be higher than in typhoid. In chronic nephritis with hydroemia it is lowered. He also believes that the viscosity test is of value in estimating the strength of the heart.

A Blood-pressure Sign for Aortic Regurgitation is given by Leonard Hill.³ In health, rest in the horizontal posture brings about an equality of

¹ Policl., August, 1909.

² Med. Klinik, September, 1909.

³ Heart, i, 1.

pressure in the arteries of the leg and of the arm. Some difference for a brief period after first lying down may be perceived in patients with atheromatous arteries, but this is quite transient. It is only in aortic reflux that there is a *marked and constant excess* in the arterial pressure of the *lower extremity* over that of the upper.

The Diagnostic Significance of a Diastolic Murmur at the Base varies according to its line of conduction. Thus according to Hoppe-Seyler,¹ "a diastolic murmur most marked over the manubrium sterni and extending over the neighboring parts of the thorax to the right, perhaps up to the throat, is a good sign of a dilatation or aneurysm at the commencement of the aorta, and is therefore a valuable symptom in the diagnosis of syphilis of the aorta."

On the other hand, according to Stein,² "if one finds by auscultation, together with a systolic murmur *ad aortam*, a well-preserved, often sharply accentuated, second aortic sound, an insufficiency of the aortic valves is excluded; and if one hears, most clearly when the patient is lying down, but usually when he is standing, also a soft diastolic murmur in the third left intercostal space, it indicates with the greatest probability, a dilatation of the arch or of the descending portion of the aorta."

The Diagnosis of Descending Thoracic Aneurysm is acknowledged to be almost impossible in many instances, by the usual physical methods of examination. This is well illustrated by the six cases recorded by Hewlett and Clark³ in their paper on "The Symptoms of Descending Thoracic Aneurysm." The great lesson we learn from all the mistakes which have occurred in the past is to suspect the condition in cases where persistent pain remains unexplained, and not to defer an examination by the x-rays.

The Diagnosis of Aneurysm in difficult cases can, according to Guisez,⁴ be made by a skilful use of the broncho-esophagoscope. But he admits that the greatest care has to be used, and that the tube should be kept above the level of the bulging which comes into view.

Arrhythmia of Various Types are enumerated in H. A. Hare's⁵ comprehensive paper on "The Relation of Some of the Recent Advances in Cardiac Physiology and Pathology to Treatment." Wenckebach's classification of cases had included (1) those in whom nothing accounts for the irregularity and no harm arises; (2) those in whom the irregularity is due to conditions in other organs, for instance, diseases or parasites of the gastro-intestinal tract; it is found more commonly in slow than in rapid hearts, and generally disappears during fever; (3) those suffering from increasing irritability of the cardiac tissue with advancing life; (4)

¹ New York Medical Journal, August, 1909, p. 279.

² Ibid., p. 878,

³ American Journal of the Medical Sciences, June, 1909.

⁴ Arch. d. Mal. du Cœur, etc., April, 1909,

⁵ Therap. Gaz., October 15, 1910,

those who suffer from definite organic lesion, but to the extent of the damage mere pulse irregularity is a doubtful guide.

Hare adds five other classes to these: "In the first class the disorder is an accident of adolescence, of that period of life which Washington described as the time 'when the sap begins to run.' In the second class it arises from sexual excesses. The third class results from neurasthenia. Closely associated with the class due to diseases which cause toxic affects are those patients who suffer from arrhythmia due to the excessive use of tobacco. Lastly, and these are the important cases, another class is met with in those who are suffering from cardiovascular disease with high arterial tension, in whom the heart often misses a beat, or tries to give an extrasystole because it is weary, just as a man pushes up hill an overloaded wheelbarrow, half stopping, or completely stopping every now and then because his task is too severe, and an instant's rest allows him to recuperate. This is the really dangerous class, because, at best, it shows that the heart is weary of its struggle or nearly exhausted."

Auricular Fibrillation and its Relationship to Complete Irregularity of the Heart as it Occurs Clinically, particularly in advanced mitral stenosis and general degeneration of the cardiovascular system, is a new aspect, presented by Thomas Lewis,¹ of the familiar condition of total cardiac arrhythmia. He recognizes two forms of auricular activity, coördinate and incoördinate. Finding in some cases an absence of coördinate contraction, he concludes, on the strength of the electrocardiographic evidence, that incoördinate contraction was present. The change from the normal type of curve to that of the type met with in complete irregularity is described. In this condition the curve consists of two parts, one attributable to ventricular activity, and the remainder constituted of irregular waves the result of auricular activity, and replacing the normal auricular peak. These waves are known to result from auricular activity because they appear in their maximal form when leads taken directly from the chest wall lie directly above the right or superficial auricle. The pure ventricular curve can be similarly obtained by leads suitably placed in relation to the left ventricle. His further evidence rests upon a comparison made between the records yielded by complete irregularity in man and "auricular fibrillation," as it is actually observed in the dog.

The Study of Heart-strain has been given considerable actuality by the recent recrudescence of the craze for phenomenal performances in the shape of Marathon races, and it has been taken up by various observers in addition to Professor Schott. By far the most important medical aspect of the question is that relating to *Juvenile Athleticism*, which was freely discussed at the 77th Meeting of the British Medical Association,² after an introduction by Tyrrell Brooks and by Clement Dukes. The conclusions worked up to by Sir Clifford Allbutt, Sir Lauder Brunton, Sir James Barr, and others are those of common-sense brought up to

¹ British Medical Journal, 1909, vol. ii, p. 1820.

² Ibid., p. 829.

date; and they were embodied in a resolution for transmission to the General Council: "That they should take into their consideration the question of securing a professional announcement as to the most suitable manner in which athleticism in schools may be so organized and controlled as to achieve the maximum of benefit and to reduce to a minimum any risk of harm to the individual schoolboy."

Some Observations on a Twenty-four Hours' Walking Race, by F. Cook, E. G. Schleisinger, and A. H. Todd,¹ from the physiological department of Guy's Hospital, acting as a special committee of the British Medical Association, have led to the following conclusions:

1. Repeated experience contradicts the popular conviction that large quantities of food must be taken in order to "keep up the strength" in contests of this kind.

2. Experiments upon animals show that external work can be performed for some days on a water diet only.

3. In order to avoid the depressing mental effect consequent upon the withholding of all food, albumen water or some such preparation might be given.

4. A walking race such as this seems to be much less satisfactory than running as a general test of a man's physical capabilities, and infinitely less so than a contest of the nature of a football match.

5. The mental factor in contests of this kind is worthy of careful consideration, the man of fine sensibility needing enormous self-control in order to compete on equal terms with the man of blunter temperament.

Hypertrophy of the Heart from Nephritis is due, according to v. Scheel,² to obstructive changes induced in the smaller arteries by some toxic circulating substance which may likewise excite the heart itself to excessive exertion, and may thus lead to hypertrophy of the right ventricle also.

Paroxysmal Tachycardia; its Etiology and Treatment. The mystery which surrounds the etiology of this affection and the urgency of the hitherto unsolved problem as to its successful treatment render especially welcome any suggestions, such as those offered in both those directions by William Gordon, of Exeter, in his paper in the *British Medical Journal* for March 12, 1910, on "The Effect of Abdominal Compression in a Case of Very Rapid Heart, with Inspiratory Obliteration of the Radial Pulse following Injury; Recovery." In the case which he reports, that of a man, aged sixty-eight years, who sustained a severe shock in a motor accident without any serious apparent lesions, an inspiratory obliteration of the radial pulse (the so-called "pulsus paradoxus") was observed, which does not appear to have been previously recorded in association with cases of this sort. *Abdominal compression*, a recognized

¹ British Medical Journal, 1909, vol. ii, p. 1526.

² Journal of the American Medical Association, October, 1909, p. 1144.

method of treatment in "paroxysmal tachycardia," in this instance seems to have been the chief means of saving life.

The onset of the tachycardia on April 10, the seventh day after the accident, was preceded for several days by flatulency and intermittence of the pulse, and was immediately accompanied with considerable gastric and intestinal distention, but not with any dyspnea, venous distention in the neck, or cardiac dilatation. The condition remained very serious in spite of the ordinary treatment until April 21, when the observation of a coincidence of failure of the pulse at the wrist with any deep inspirations, suggested to Gordon the application of abdominal compression by means of a stout flannel binder. The result was not immediate, but after twelve hours the pulse had fallen from 150 to 88, and after a temporary rise it dropped permanently; and the binder was loosened on April 26. On May 6 the binder was again applied during a short attack, and was kept on for a few days. A third and more alarming attack occurred on May 12; and on May 16 the binder was again very tightly applied, with the result that within a quarter of an hour the pulse fell from 164 to 96, with occasional intermissions, as on the previous occasions. Rapid improvement ensued, with permanent recovery. These are the most essential features in the case upon which the author bases his interesting remarks.

The attacks seemed clearly in some way consequent on the accident; also on the flatulent indigestion. Gordon fancied that a decrease in the amount of fluid ingested tended to increase the liability to tachycardia. The temperature throughout was normal except at the time of each attack, when it only rose very slightly. The blood pressure, determined by Potain's sphygmomanometer during the last attack, on May 15, was only 100 mm.

"So many diverse conditions have been described under the name of "paroxysmal tachycardia," that it has ceased to have any precise significance. It was first applied to those cases in which, without discoverable cardiac lesion, and often without obvious reason, a normal pulse rate suddenly or almost suddenly, rises to a very high frequency, maintains it for minutes, days, or weeks, and then suddenly, or almost suddenly, returns to its original pace. Such cases are altogether different from the present one."

Gordon's view of the pathology of this case was suggested to him by two observations; that of the inspiratory obliteration of the pulse during the attacks—and that of the curative effects of abdominal compression. The latter brought to his mind a striking case of *sudden death*, hitherto unpublished, which deserves on its own merits to be recorded.

"A patient with left-sided empyema was having the empyema washed out, when he suddenly became faint and quickly died, with the appearance of one suffering from a rapid internal hemorrhage. At the *postmortem* examination no hemorrhage was found, but the abdominal organs

presented an appearance such as I have never seen before or since—the solid organs swollen and purple with excess of blood content, and, when cut, running out like overfull sponges. The splanchnic nerves, it will be remembered, run down within the thorax.”

Gordon's comment is that “if paroxysmal tachycardia can be really determined by dilatation of the splanchnic area, and the consequent greatly diminished supply of blood to the left ventricle, it is easier to understand the usually sudden manner of its inception and termination.”

Gordon states: “With regard to the inspiratory obliteration of the pulse, the so-called ‘pulsus paradoxus’ (a term which surely ought to be given up), one cannot be expected to acquiesce in the present attitude of needlessness of explanation. If the phenomenon means anything in a case in which heart and lungs are free from demonstrable disease, it surely must indicate that the left side of the heart is so imperfectly supplied with blood that the intrathoracic suction action of inspiration, resisting outflow from the chest, is sufficient to greatly lessen the outgoing current. It was in this sense that I interpreted it. The pale, livid face and hands suggested arteries half empty. The blood itself was normal. Where, then, was the blood? One could only suppose that it was ponded in the splanchnic area, much as most people believe it to be in surgical shocks when the pulse rate may rise to an uncountable point.”

It must be admitted that there is much in the case and in the arguments to lead us to a conclusion that paroxysmal tachycardia is not so much a cardiac affection as a vasomotor upset of the circulation. Every clinician has wondered why so sudden and intense a disturbance of the cardiac rate as that witnessed in the usual case of paroxysmal tachycardia should be conspicuously characterized by the patient's almost complete immunity from cardiac distress during the attack, and should be compatible with a no less rapid recovery of cardiac efficiency, and of cardiac endurance under exertion subsequently for prolonged intervals, or permanently.

Dr. Gordon's reading of *the mechanism of the disturbance* seems to afford a more satisfactory explanation than any yet proposed for the various paradoxes presented by the patient's symptoms, and also by the hitherto unaccountable effect of various measures of treatment, some of which might have been regarded as the very last to be fit to recommend, and as the least likely to succeed.

Among other mysterious aspects which needed clearing up, it is enough to mention the remarkable peculiarity that, alone among cardiac attacks, the paroxysm of tachycardia does not of necessity materially disturb the respiration. It may set up (apart from any purely *cardiac* effects of exertion during a paroxysm) neither *respiratory* dyspnea nor any noteworthy *respiratory* tachypnea. The inference, to which we had held, that neither the lungs nor the heart can be primarily at fault, would now be getting some more substantial confirmation. And assuming,

as a further inference, that we are really dealing with a vasomotor "storage-congestion," Dr. Gordon's splanchnic theory would derive considerable collateral support from the clinical fact that it is certainly not the pulmonary reservoir which is the seat of the storage, as in many cases there is no essential interference with respiratory rate, or respiratory efficiency, such as any severe pulmonary congestion must inevitably have involved.

In connection with treatment, Gordon believes that the effect of the binder can best be explained by its effect on the overcharged splanchnic circulation, and he states that there are a considerable number of cases on record in which treatment directed to emptying the splanchnic vessels—compression of the abdomen in various ways, even inversion of the patient—has reduced the excessive rate of the heart to normal. Sir Clifford Allbutt refers to this in his article in the last edition of his *System of Medicine*, and references to a number of instances will be found in Professor Hoover's article in Osler and McCrae's *System*. Dr. Herringham has added atropine, and Sir James Barr vascular dilataints to the long list of previously suggested remedies.

Vomiting and Other Helps in Tachycardia Savy¹ believes that this and all analogous agencies—holding the breath (Laache, Apert, etc.), the effectual action of a fright, of prolonged inspiration, of an automobile accident, of compression or faradization of the pneumogastric nerves—all act in the same way by direct or indirect excitation of the pneumogastric nerve or its centres. Two or three tablespoonfuls of syrup of ipecac always answer. Savy mentions a few cases in which an attack of paroxysmal tachycardia was arrested by accidental vomiting, after which the patients learned to induce vomiting systematically to arrest the attack. The pulse in one case dropped in thirty seconds after the vomiting from 200 to 94, from 209 to 96, and from 200 to 80. The means employed to produce the vomiting seems to be immaterial.

Paroxysmal Tachycardia in Phthisis, a rare complication of which Bertier² gives two cases (and refers to two others), was also treated successfully in all of them by vomiting induced by ipecacuanha.

The Therapeutic Value of the Infundibular Extract in Shock is advocated by W. Blair Bell³ on the strength of the pressor virtues it was shown to possess by Oliver and Schäffer, in 1895. The infundibulum is the *posterior lobe*, which is rather smaller than, and more or less an enclave of the anterior lobe. He thinks that the extract will be found effectual in the treatment of paralytic distention of the bowel. In some respects, the preparation is far ahead of adrenalin, apart from its greater efficiency and more prolonged action on the involuntary muscle fibers, especially of the heart and kidneys. After a short initial increase in the frequency,

¹ Arch. de Méd. et de Ch., February 3, 1910.

² Lyon Méd., February 20, 1910.

³ British Medical Journal, December 4, 1909.

the extract slows the heart and causes more powerful contraction, whereas adrenalin causes acceleration. While adrenalin causes a diminution in the secretion of the urine, infundibular extract has a marked diuretic effect, which is of very great postoperative value. There is also reason to believe that the extract may prove to be even more effective than adrenalin in producing local anemia. The active principle is likely to be an amine related to those from ergot, placental extract, putrid meat, etc., and may perhaps be manufactured synthetically.

The most complete account of the varied uses of the pituitary extracts will be found in A. Delille's book, *Hypophyse Etude Experimentale et Clinique*, Paris, 1909.

Suprarenin Intravenous Injection, on the other hand, is recommended by John¹ for severe cardiac and vascular collapse. A dose of 0.2 to 1 c.c. of the standard solution, diluted if desired (1 to 10), should be injected if other restoratives fail, and should supersede the latter. The risk of fatality only arises in cases of cardiac exhaustion due to renal atrophy.

Angina Pectoris, the disease of Heberden, of Rougnon, of Morgagni, perhaps even of Seneca, who gave us the term "meditatio mortis"—but chiefly the disease of Heberden—was taken up by Wm. Osler² as the subject of his Lumleian Lecture, and handled with singular freshness. A good deal of originality is foreshadowed in the definition which he gives of it as "A disease characterized by paroxysmal attacks of pain, pectoral or expectoral, associated with changes in the arterial walls, organic or functional," and in his comment that "its protean features cannot be understood unless we remember that between the chief parts of this system, the heart and the arteries, there is no essential difference, since the arteries are only a long-drawn-out heart, and the heart but a bulbous expansion of an artery."

Osler deals with the anginal paroxysm in all its grades, even that identified by a mere sense of substernal distress. In general etiology he brings out the well-known facts as to its special prevalence among the upper classes, in men rather than women, rather after than before the age of fifty, and lastly, in unmistakable degree, in the profession of medicine before and since the days of John Hunter. In Ogle's³ well-known study, "Statistics of Mortality in the Medical Profession," among 3865 deaths, 444 were undefined diseases of the heart and circulatory system, though only 34 deaths were specified as due to angina pectoris. The same dominance of cardiovascular disease is indicated in the Registrar-General's Report.⁴

The classification into three degrees of severity—(1) mildest or larval, (2) mild, and (3) severe—is both simple and comprehensive. It enables

¹ Münch. med. Woch., November 29, 1909.

² Lancet, 1910, vol. i, p. 697.

³ Trans. R. Med. and Chir. Soc., vol. lxix.

⁴ Decennial Supplement, part ii, 1908.

him to reckon as anginal various ill-determined symptoms such as he describes under the heading of "formes frustes," including the distressing substernal tension experienced by orators. In addition to the emotional causation there are the forms due to muscular exertion and to high blood pressure, respectively.

Angina Minor, the mild form, that usually described as "false or pseudo-angina," with comforting regard for the bedside, is not really separable by any inherent difference in the symptoms from the worst type of the affection. It has its well-known subgroups, the neurotic, the vasomotor, and the toxic forms—and its well-known peculiarities, which are a milder character of the attack, a more hopeful outlook, and also a smaller incidence in the female sex.

Angina Major is characterized by its severity, by the almost uniform presence of arterial disease, and by the liability to sudden death. Its varieties are classified by Osler on a clinical basis: (a) The fulminant or rapid form with one or two attacks only, or sometimes with the condition known as *status anginosus*; (b) the form with a duration of one and a half to two years and a varying number of attacks; (c) the chronic form, lasting upward of ten years with a varying number and growing intensity of attacks, that for instance of John Hunter, whose first seizure occurred twenty years before his death; and (d) lastly, the small group of cases which may last for months or as long as two years, with attacks of great severity, and yet may completely recover.

WHAT IS THE NATURE OF ANGINA? Osler bases his conception of angina upon the results (in 1867) of the pioneer studies of Nothnagel on the vasomotor aspects of the seizures, and upon the more recent interpretation given of the vasomotor disturbances by James Collier under the descriptive name of *vascular crises*. If it could be shown that the pain is essentially a vascular pain, a single explanation would be afforded for the subjective as well as for the objective event—for the suffering and for the death.

In this connection we may recall that Sir Clifford Allbutt had conceived many years ago, and has recently insisted again and again, that the whole trouble is aortic rather than cardiac, a view which is also identified with the name of Professor Peter, who laid much stress upon the painful symptoms of aortitis. We note, too, that shortly after Osler's lectures, H. Walter Vernon¹ published a paper in support of the *vascular localization* of the spasm and of the pain in various severe spasmodic affections, and in particular in angina.

Osler's argument in favor of the view that the pain of angina is essentially a vascular pain is derived from the clinical observation first made by Heberden himself that fatal angina may be from first to last purely *peripheral* in its manifestation. He places before us a series of

¹ Pract. Med., 1910.

these *extrapectoral* or *extracardiac* forms; and he groups the cases as variously identifiable with (a) peripheral, (b) abdominal, (c) pulmonary, and (d) cerebral features.

(a) *In the peripheral group* famous instances of the *brachial* type are that described by Heberden in his *Commentaries*, and the case of Lord Clarendon, described by Blackall in his classical book on *Dropsies*. Osler adds four instances from his own experience, in which the same brachial localization prevailed in some degree.

In three of his cases the localization was in the legs at first. One of the patients spoke of this pain as the "signal symptom." Osler remarks that "all the vasomotor phenomena, even to fainting, may be associated with the extrapectoral pain."

Among the most remarkable cases in the group, which also includes instances of an implication of the testicle and of the well-known angina cruris, was one in which the anginal pain was limited to the right pectoral muscle and recurred in that situation during a period of four years, with only occasional irradiation down the right arm.

(b) *Angina Abdominis* often presents a striking similarity to the gastric crisis of locomotor ataxia, particularly in those cases in which the thoracic symptoms are ill-developed or even absent at first. The solar plexus is supposed to be involved; and Potain had suggested the possible existence of an aortitis, while Leared, in 1867, and subsequently Huchard, have dwelt upon the gastralgie feature of many of these cases. In most of these varieties the pain has a tendency to ultimately extend or migrate into the usual thoracic site.

The responsibility of diagnosis in all these cases has become greatly increased of recent years since we have obtained better knowledge of the symptoms of a variety of previously unsuspected causes connected with pancreatic, biliary, and duodenal complications. Angina may simulate any of them, but it may also be an associated symptom added to those of the lesion.

(c) *The Respiratory Features of Angina* are practically limited to the attack or to the status anginosus. The affection is neither pulmonary nor respiratory in its essence, as shown by the perfect freedom from chest signs during the interval; but the respiratory function is interfered with by the seizure in varying degrees, ranging from a temporary check to an abrupt and permanent cessation, while the heart may continue to beat for many minutes. Again, Cheyne-Stokes breathing is a common observation. These are the major medullary disturbances. There are other manifestations connected with the bronchial and the vascular mechanisms of the lung which reproduce with varying severity the functional disturbances of asthma, and of paroxysmal edema. The cardiac factor underlies them all, and it may be difficult to strictly define the relative provinces of cardiac asthma "with the orthopnea, light cyanosis, and rapid feeble pulse of myocardial weakness," and of the pulmonary asthma.

According to Osler's lucid exposition, there are four special types: "(1) the universal distention of the lungs in an acute emphysema as Goodhardt described it; the inspiratory excursion is limited; expiration is prolonged; in one patient the chest even looked larger; and the increase in the volume of the lungs may be demonstrated by percussion. The condition is what von Basch has called "lungenschwellung" and "Lungenstarrheit," a state which he believed to be due to distention of the capillary network, with swelling of the alveolar walls. (2) The rapid onset of the physical signs, like those of an acute attack of bronchial asthma, wheezing, fine bubbling rales, and prolonged expiration. Within ten minutes the attack may be in full swing. (3) Acute edema of the lungs may follow, indicated by a great increase in the bubbling rales and the rapid expectoration of large quantities of a thin, frothy, sometimes blood-tinged liquid. The attacks may be transient, lasting only for a few hours, and give a very special pulmonary stamp to the attack. (4) Increased blood pressure, rising to 250 mm. and over (Riva-Rocci). In one case (Dr. J. H. K.) the record was 340 mm. during an attack, in the intervals it was 250. On three occasions he brought up large quantities of a clear fluid, with blood."

It is not surprising that these profound vascular disturbances should sometimes culminate in partial or absolute consolidation, and among the instructive series of illustrative cases there is one which was observed by Dr. T. McCrae which occurred in a man, aged thirty-five years, who died from angina. The attacks yielded promptly to amyl nitrite, but in the last one there were acute pulmonary symptoms for twenty-four hours, oppression, cough, etc., and scattered areas of consolidation with tubular breathing and rales.

(d) *The Cerebral Features of Angina* are briefly discussed. Their association might have been expected to have been even more frequent than it is in a clinical group where vascular disease is preëminently localized in the cerebral arterial supply in conjunction with its coronary localization.

Unconsciousness during the attack was regarded by Trousseau as pointing to a relationship between angina and epilepsy. Some of these cases may have been instances of the Stokes-Adams syndrome. Others may be interpreted as transient cerebral attacks such as are not uncommonly observed in arteriosclerosis. *Aphasia*, of which a remarkable instance is recorded, is a rare complication. *Cephalalgia* was a striking feature in a patient who, in the attacks, had an intense pain at the back of the head, inside he insisted, and he would hold his head between the hands to avoid pain on movement. *Transient hemiplegia* was observed in a man, aged thirty-one years, who had five anginal attacks in a month, usually induced by exertion, one with unconsciousness. "He had not had syphilis, nor was there heart disease. He had had, on several occasions, temporary loss of power in the left hand, with numbness. In

the paroxysm just before admission, which was of great intensity, the left arm and leg were paralyzed for two days. The face was not involved.

THE CAUSATION OF ANGINA PECTORIS. This is the theme of Byrom Bramwell's¹ most instructive clinical lecture. "At the outset," he points out, "any theory of the causation of angina pectoris, if it is to be satisfactory, must explain the facts: (1) *That in the great majority of cases of angina pectoris the pain radiates down the left arm; (2) that in some cases it radiates down both arms; and (3) that in exceptional cases, which are very rare, it is referred to the right arm only.*"

There is for him an *organic* form and a *functional* form, not always easy to discriminate, and this leads him to study the afferent (sensory ?) nerve apparatus of the heart. The exact course of the afferent fibers conveying impressions from the heart to the cerebrum have not yet been fully determined.

"Afferent (sensory ?) impressions, passing to the cerebrum from the heart through the sympathetic, pass via the spinal cord, while afferent impressions passing from the heart through the vagus join the nerve centres at the medulla oblongata.

Henry Head gives the following tabulated statement of the *sensory supply of the heart*:

Transverse arch of aorta	Inferior laryngeal segment.
Ascending arch of aorta	Third and fourth cervical, first, second, and third dorsal (fourth dorsal ?).
Ventricle	Second, third, fourth, and fifth dorsal (sixth dorsal).
Auricle	Fifth, sixth, seventh, and eighth dorsal (ninth dorsal ?).

Gaskell says that the afferent nerves of the heart have their nerve-cell stations in the posterior root ganglia of the thoracic nerves (second to fifth), largely in the second thoracic, and that possibly there are a few in the first thoracic.

"Theoretically, we may suppose that the pain may be due to: (1) Irritation of the sensory nerve terminations *in the wall of the heart itself*, including under this term the pericardium, myocardium, and endocardium. (2) The sensory nerve fibers comprised in the coronary and the superficial and deep cardiac plexuses. (3) The sensory conductors which connect these plexuses with the sensory perceptive centres in the cerebrum. In the case of the sympathetic conductors the seat of irritation might theoretically be placed in (*a*) the branches connecting the cardiac plexuses with the spinal cord, including the posterior roots and posterior ganglia; (*b*) the spinal cord itself; (*c*) the conductors above the spinal cord—that is, between the spinal cord and the perceptive centre. (4) The perceptive cerebral centres themselves. Possibly the cardiac pain may be produced in most of these ways."

¹ British Medical Journal, 1910, vol. i, p. 126.

The pain in most cases, he believes, is due to *irritation of the afferent (sensory ?) nerve terminations in the wall of the left ventricle*, including under the term "wall," the pericardium, myocardium, and endocardium.

"We know that *cramp* in the calf is most apt to arise when the muscle is exhausted and fatigued; all football players must be well aware of this fact. Gaskell has shown that when the vitality of the cardiac muscle is impaired (by exhaustion, by injury, by malnutrition, etc.) it loses its power of rapid contraction in the same way as unstriated muscle. James Mackenzie does not agree with the view that spasmodic contraction of the cardiac muscles is the cause of the irritation."

He thinks that in angina pectoris the pain is not felt in the heart itself, but in the thoracic wall; that the pain in the region of the heart is a referred pain, exactly similar in character to the pain in the left arm, which is such a characteristic feature of angina pectoris.

Henry Head believes that the cause of the irritation of the sensory nerves of the heart and of angina pectoris is increased tension in the cavity of the left ventricle. He says: "Now, it is this distention at the moment when the walls of the cavity are at rest that is most pernicious, and it is this condition above all others that is most liable to lead to referred pain." And again: "Thus, in conclusion, it would seem that the most potent conditions for the production of referred pain are: (1) The maintenance of considerable tension within a cavity of the heart, accompanied by (2) a sudden accession of tension (owing to regurgitation) at the moment when the walls of the cavity are dilating after systole."

Bramwell sums up thus: (1) There is a sudden strain thrown upon the left ventricle. (2) The consequence of the strain upon the fibers which are disabled tells as an irritation upon the sensory cardiac nerves, producing anginal pain. (3) This irritation is reflected, via the sympathetic branches of the cardiac plexus, distributed to the left ventricle and the spinal cord (left side of the upper dorsal segments), in the form of pain to the periphery.

"But, further, in the exceptional cases of angina pectoris in which the pain radiates to *both arms or to the right arm alone*, the 'coarse' lesions, which are associated with and which are apparently the cause of the pain, often (? always) involve the root of the aorta or the aortic arch.

"*That disease at the root of the aorta*, or stretching of the root of the aorta, is the usual cause of angina pectoris, as Sir T. Clifford Allbutt supposes, seems to be contradicted by the fact that in the great majority of typical cases of angina pectoris the pain is reflected to the left shoulder and left arm."

Another explanation for the pain in both arms is the possible *overflow* of a very severe irritation into the right half of the spinal cord; and yet another explanation—that the nerve terminations in the *right ventricle* may have become irritated.

"*The intermittent claudication view*, which is a modification of the anemic theory (but which does not necessitate the supposition that there is spasmodic contraction of the coronary arteries), is more probable than that of a coronary arterial spasm."

As the coronaries are atheromatous (in the organic form) "it seems not unreasonable to suppose that when a sudden strain (whether actual or relative) is put upon the left ventricle, weakness and overdistention or spasmodic contraction of the muscular fibers or of some of the muscular fibers of the left ventricle may occur, and an attack of angina pectoris may be developed, just as spasmodic contraction of the muscles and pain in the leg may occur in cases of intermittent claudication as the result of muscular effort."

THE NATURE OF THE ANGINAL PAIN. When, in the most typical of cases, pain is immediately associated with motor disablement on the common basis of extreme vascular disease; when, in that pain of heart distress, the respiration is also touched though the lungs are perfectly sound; can we safely dissociate from the vascular etiology of the disablement the etiology of its painful result? Can we also isolate the explanation of this cardiovascular crisis *par excellence* from the mechanism explaining the great abdominal vascular crises?¹ Is not the whole drama vascular from beginning to end, and most of all at the end?

Alexander Morrison,² who opened a discussion on the nature of angina at the Harveian Society, argued "that even the commencement of referred pain in the peripheral area, such as the arm, in no way invalidated belief in intra-aortic or intracardial nerves being also the seat and site of referred pain. The majority of cases of so-called vasomotor angina with valvular disease tended to subside without accident, but non-valvular cases might rapidly terminate fatally, and required, not merely the use of nitrites, but also of morphine, atropine, and general anesthesia for relief and to arrest death." Sir John Bdberoant thought that most attacks were due to a spasm of the vessels induced by cold and exertion. Among the many other suggestions offered was also that the shock of the pain was the real cause of heart arrest. This, however, does not account for those instances where the sudden death is painless.

Otto May³ has subsequently suggested, in despair of any mechanical explanation, *some chemical change* in the myocardium, the result of a disordered metabolism of the heart muscle. This conception tends to bring it into line with other painful conditions—notably, "cramp" of involuntary muscles and the "lightning pains" of tabes dorsalis, as Mott and others believe that the latter are caused by gradual liberation of chemical irritants from the degenerating posterior root neurons. This view has displaced the earlier one, that the pain was due to pressure from

¹ E. Maylord, *British Medical Journal*, 1910, vol. i, p. 617.

² *British Medical Journal*, 1909, vol. ii, p. 1678.

³ *Ibid.*, January 1, 1910.

sclerosis of the roots. It affords a ready explanation of the clinical observation that the pains often cease when ataxia develops, and that in those patients who never become ataxic, pain continues to be a prominent feature throughout the course of the disease.

THE GENERAL PATHOLOGY OF ANGINA. In conclusion, we have not reached the solution, but the problem is a vascular one. Views may vary according to the meaning attached to the name. Most of us will share Sir Richard D. Powell's opinion that typical angina is due to disease and thrombosis of the coronary arteries, not classing as "angina" mere aortic pain following exertion. A rise of arterial blood pressure is an important factor in the causation of angina pectoris; he has seen cases in which development of mitral regurgitation brought about relief from anginal attacks. Sir Clifford Allbutt considers the cause of uncomplicated cases to be disease of the aorta above the valves; the distribution of the radiating pain depending largely on the part of the aorta affected. There is a pain arising from the heart itself, and situated in the precordial area, which is quite distinct in character from the pain of a typical angina attack. Sir Lauder Brunton compares the pain of angina to the contraction of a distended bladder. It is due in some cases to increase of arterial blood pressure; in others spasm of the coronary arteries is an important factor. We have also given Osler's and Bramwell's opinions, and there are many other views. Who shall decide?

After reading all these views and sundry others, one is left to contemplate three great essential facts, which it would be unphilosophical to attempt to tie up with any one theory as to the mode of causation, namely: (1) *Acute motor disablement* of the heart, which may be functional as that of the hand "which goes asleep" to wake again; or organic, and making for necrosis, as that of the *hand* paralyzed by permanent arterial obstruction. In the latter case it is made up of abiding progressive cardiac weakness, as well as of the superadded paroxysmal disablement, which may itself prove fatal "sans phrases," without any utterance of pain. (2) *Acute sensory anguish*, connected, though not in an invariable way, with the motor disablement. (3) In the most typical and the most severe cases, *extreme arterial disease*, of long standing (during which it had remained quite painless); and *extreme degeneration of heart fiber* without a vestige of any previous hypertrophy, or of any existing dilatation. A most obvious mechanism of destruction: Slow death and sudden death in one and the same subject—both of them on an exclusive and demonstrable basis of *vascular obstruction*.

There is a deep suggestiveness in that contemplation.

THE TREATMENT OF ANGINA, both that of its paroxysm and of its underlying condition, must still await further indications from etiology. The present views of Sir Clifford Allbutt and of Alexander Morrison are fully stated in the *Therapeutic Gazette*.¹ They are fair samples of the

¹ 1910, pp. 205 and 208.

prevailing estimate of the best lines to be followed. As in prognosis, so with treatment, Osler recognizes three great groups: The syphilitic, the neurotic, and the arteriosclerotic. In the first of these the issue turns upon the question whether or not the case has been duly treated—with mercury for the spirochetæ, with potassium iodide for the exudate in the media and adventitia, and, be it said also, for the pain which is so much relieved by that drug.

The neurotic group is the most hopeful—and here again the proper treatment is not beyond our every-day resources. A modified Weir Mitchell cure, with hydrotherapy, meets the indication in many cases. The wet pack and counterirritation of the precordium are also to be mentioned. In some neurasthenics with high tension the nitrites are of use, and also in the toxic forms, particularly that due to tobacco, Osler has found advantage in cases presenting extreme vasomotor ataxia from extract of ergot (ergotin) 2 or 3 grains three times daily.

The treatment of the severer form has been taught us by Lauder Brunton. Amyl nitrite will not, however, always conquer the pain. For this morphine is indispensable, and sometimes very large doses are needed; unless indeed we resort to chloroform, which is not so dangerous as might have been expected, and which gives relief.

Oxygen inhalations, and sometimes digitalis under the skin, are additional remedies. The routine of local and of restorative measures and that of nursing does not need to be described.

The treatment during the interval is that which should really begin before "the point in life when the pace is the fastest, whether we put it at twenty-five with Plato, at forty with Montaigne, or by the patient's own showing at the grand climacteric (sixty-three). In cases of extreme blood pressure, drugs are relatively powerless. But when the nitrites and potassium iodide have been convicted of failure there remains nature's great prescription, which Osler sums up in four words: 'Go slowly; eat less.' "

DISEASES OF THE BLOODVESSELS.

There has been no flagging of professional interest in this direction; indeed, the attention devoted to the subject seems to be growing at a greater rate than before. More of pathology is drawn into the circle, and more of clinical medicine is being centred in it. To borrow Osler's graphic metaphor, medical doctrine seems to be "riding on the crest of a great cardiovascular wave." The number and the importance of recent publications relating to affections of the heart and circulation, and particularly of the bloodvessels, must therefore claim our attention and a good deal of our space in this report. This multiplicity is almost bewildering to the ordinary man. He will probably welcome the lucid summary of the whole subject of chronic arterial disease which in

J. G. Adami's Philadelphia address,¹ is combined with an account of its latest developments.

Arteriosclerosis. THE NATURE OF THE ARTERIOSCLEROTIC PROCESS. Adami,² adopting Klotz's most recent results, uses the term "arteriosclerosis" as the least misleading. He integrates under it the known varieties of chronic arterial disease, including the atheromatous degeneration which is merely a secondary phase, and even the syphilitic form, so distinct in its etiology and development that Marchand and others would keep it separate. This concentration movement is based upon a recognition by Adami that the media, and especially its *muscular* element, is the main seat of the original failure in all forms, and that *overstrain* (as opposed to mere strain which induces *strain-hypertrophy*) is the one common determining cause of the yielding of the vessel wall, and of all the consequences.

"The dominant primary event in the arteriosclerotic process, whether syphilitic, senile, or functional, is a localized, or it may be a diffuse, weakening of the arterial wall and especially of the media. This induces increased strain upon the remaining coats; and, if not excessive, that strain leads more especially to connective-tissue overgrowth and to the development of the characteristic lesions."

1. *In the aorta and its branches, the preëminently elastic arteries*, such as the carotids and iliacs, the "*Moenckeberg type*"³ of sclerosis is seen, with its slight sacculations. It arises from the essential calcification of the muscular fibers of the media described by Klotz.⁴ It is not necessarily introduced by any sclerosis; but may follow in the wake of Savill's "Hypermyotrophy" from strain, as subsequently insisted upon by W. Russell. As in elderly people, this type commonly occurs in association with the *nodose type* prone to atheroma (often seen in the abdominal aorta); both types may be regarded as "diverse manifestations of a common state."

A purely *senile form* is referred to by Adami, in which there is no nodose thickening, but aortic *thinning, dilatation, and tortuous elongations*. Although this is merely degenerative rather than sclerotic, nevertheless there is some sclerosis in the smaller vessels, with hypertrophy and fibrosis of the media and often well-marked periarterial fibrosis.

In the *syphilitic type* (Döhle, Chiari, and others) the "succulent semitranslucent nodes, usually situated and liable to coalesce in the ascending aorta and arch, tend to scarring and to puckering rather than to atheroma or calcification." In this type, an intima overgrowth

¹ Proceedings of the Pathological Society, Philadelphia, 1909, n. s., xii, p. 309-334.

² American Journal of the Medical Sciences, October, 1909.

³ Virch. Arch., 1903.

⁴ Journal of Experimental Medicine, 1906, viii, 330, and other papers.

characterized by vascularization is combined with the primary subacute mesaortitis, and helps to clear away its debris. Another feature of syphilis is its tendency to cause a thinning of all the coats and to the production of aneurysm.

2. As to the second type of artery—the *muscular arteries and the arterioles*—here the same types are met with, but without the same degree of atheromatous or degenerative change. As regards their intima, reference is made by Adami to the etiological factor (which was pointed out by the present writer at the Toronto Meeting of the British Medical Association of 1906), of the cutting off of the nutritive lymph supply by heaped-up layers of dense new connective tissue, but it is the media which Adami finds most altered.

In the *arterioles* the varieties described have been: (1) *Muscular hypertrophy* of the media; (2) *pervading fibrosis* of all three coats (both these types have been found in the kidney); (3) *obliterative endarteritis*, either (a) by endothelial proliferation, or (b) by fibrosis, or possibly (c) by fibrosis originating out of the endothelium (Baumgarten).

Adami, on the strength of Klotz's results, attempts to harmonize the diversity in all these types on the principle of compensation: "Degeneration of one coat, the media, being accompanied or followed by overgrowth of the other, the intima, nay sometimes also of the adventitia.

Granted that a primary giving way of the media had occurred under the damaging influence of pressures which may be abnormally high, or need be only relatively high in weakened vessels, the nodose proliferation of the intima may be regarded as a *strain-hypertrophy*.¹ This is a more intelligible view of the mechanism than Thoma's, the increased strain on the intima causing a thickening equivalent in resistance to the damage in the media. Carrel² has recently illustrated this compensatory overgrowth in the cat, in the serial changes undergone by a length of one of its veins when this is substituted for an excised length of its carotid. At first great pressure dilatation occurs in the vein, but after a while all its coats become thickened by fibrous tissue, until finally the wall of the vein becomes thicker than that of the artery itself.

The case is very different where the media is so greatly damaged that there is *overstrain* of the intima. Instead of the stimulus to growth, there is atrophy. In this case, the absence of the nodal thickenings shows that these are not inflammatory, but due to work hypertrophy. This atrophy is seen in the aneurysms of the syphilitic form.

The *ordinary arteriosclerosis* of advancing life, with its nodose and its Moenckeberg lesions, is susceptible of the same explanation on the basis of a primary failure of the media, whether from mere age or from other factors of interference.

¹ Adami, Med. Rec., 1896, pp. 469-505; British Medical Journal, December, 1906.

² Journal of Experimental Medicine, 1908, x, 130.

As regards the *aging of elastic tissue*, Aschoff's histological studies have revealed progressive changes in the aortic media. These occur from infancy (when there is a clear alternation of muscle and elastic layers), onward through childhood and youth, up to the age of thirty-five, by a gradual increase of the elastic elements, and by their felting by means of secondary filaments traversing the muscular layers. After a pause of fifteen years the elastica begins to dwindle and the whole media becomes thinner. Klotz, working independently on the same subject, has quite recently, with the assistance of Foster, verified this progression up to the age of fifty. His remarkable observations show that after that age, it is not the elastic but the muscular fibers which show atrophy,



FIG. 16.—Sections from a case of syphilitic mesaortitis stained by the elastic-tissue stain to demonstrate the extraordinarily degenerated and diseased appearance of the elastic tissue through syphilitic mesaortitis. It will be seen that at X the elastic fibers have completely disappeared; at Y they are reduced to irregular masses. There is some definite hypertrophy, both of the intima, I, and of the adventitia, A, but this has been insufficient to prevent a certain giving way of the wall. (From a specimen prepared by Dr. Klotz).

going on to complete absorption, following upon a necrosis which is first indicated by a fine granular calcification; to this the thinning of the media is due. At the same time, the elastica itself may suffer some slighter calcification; it loses its elasticity, becoming more rigid as the result of internal pressure and unapt to recoil to its former length. It is noteworthy that the disappearance of many muscular fibers brings the elastic lamellæ closer together, and that “whereas in the young aorta they are wavy, owing to the contraction of the intervening muscular fibers, now they are relatively straight.”

In the remarkable dissolution of the elements of the media, which Klotz has recently demonstrated in syphilitic mesaortitis, the elastic tissue suffers heavily. One of his specimens, reproduced in Adami's

paper, shows its "extraordinary degree of degeneration, amounting, in the region where there is most extensive small cell infiltration, to a complete disappearance."

With reference to Jor's view,¹ so largely favored in Germany, that the fundamental change in arteriosclerosis is that of the *musculo-elastic layer of the intima*, Adami objects that this layer is well-developed only in the aortic stem and main branches where it is akin to the media (with longitudinally arranged plain muscle fibers and abundant elastic fibrillæ); but that it is practically absent from the muscular arteries. Adami resorts, for an explanation of the fact that in the aorta this layer is specially prone to exhibit degeneration, to the same argument which was offered in 1906, in Toronto, by the present writer,² namely, "An Introduction to the Clinical Study of Vascular Disease," that its position relative to the sources of nutrition is largely at fault. "It has no independent source of nutrition, and, more particularly if the superficial layers of the intima have undergone thickening, the factors favoring degeneration are clearly greatly increased." Adami also states that "the intima is in itself non-vascular, and receives its nourishment by diffusion from the plasma within the aorta, as indeed would also seem to be the case with the innermost layers of the media." But "the striking picture of this layer in the early stages, the swollen cell elements, the interstitial edema and the diffuse soapy and fatty change, all tend to divert attention from the concomitant medial and superficial intima changes. The yellow, fine, *fatty streaks* in this layer, to be seen in otherwise healthy young aortas, are not to be regarded as necessarily possessing any arteriosclerotic association."

Klotz and K. Ziegler³ independently pointed out that medial degeneration and giving way are the dominant lesions in adrenalin disturbances. Adami suggested at Toronto, in 1907, that the reason for the lack of intimal overgrowth might well be the acute development of the medial degeneration, resulting in rapid expansion of the intimal sheath and overstrain rather than strain; and that a less extreme degeneration might be found to result in a more typical arteriosclerosis with intimal hypertrophy. Since then Klotz, by a different method, has demonstrated the truth of this surmise by setting up arterial disease in rabbits without the use of any drug and by merely suspending them by the hind legs, head downward, for three minutes daily for 100 to 120 consecutive days. The heart is found greatly hypertrophied, the arch and the thoracic aorta are dilated, with very distinct thinning of their walls; the abdominal aorta, on the other hand, is unaffected; the carotids are larger than normal, and—this is the important point—they exhibit a

¹ Ziegler's Beiträge, 1902, xxxii, 146.

² Edinburgh Medical Journal, 1905, vol. ii.

³ Ziegler's Beiträge, 1905, xxxviii, 229.

typical irregular intimal sclerosis. There is pronounced connective-tissue thickening of their intima.

These results can only be explained in one way, namely, as the effect of the daily temporary suddenly increased blood pressure brought to bear upon the vessels of the anterior half of the body. This leads to diffuse dilatation of the larger vessel, the aorta, without intimal overgrowth, and to pronounced intimal overgrowth of the smaller vessels, the carotids. Here, for the first time, I think, we have an absolute demonstration that one and the same cause is responsible for the two conditions, a demonstration that the arterial thinning of the Moenckeberg type, and the intimal thickening of ordinary (senile) arteriosclerosis are diverse manifestations of a common process.

Harvey, of Toronto, continuing the work begun under Professor J. J. MacKenzie, has independently, in the laboratory of Professor Dixon, of Cambridge, England, brought about the same diffuse dilatation of the aorta and cardiac hypertrophy by temporary digital compression of the rabbit's aorta extending over long periods. Adami's views as to the production of strain hypertrophy gets collateral support from Aschoff's explanation of the progressive increase in the elastic tissue of the aorta as an effect of work hypertrophy.

On the other hand, there may be as well-marked intimal nodes of the aorta when the underlying media shows no recognizable thinning. An explanation may be afforded for this state of affairs along the lines of Thoma's well-known observations upon the disappearance of the projecting intimal nodosities when the aorta is filled with melted lard under pressure.

As regards the main etiological question, that of *the influence of heightened arterial pressure*, Klotz's experiment shows that increased intravascular pressure alone may be the cause of the medial degeneration and weakening in the first place; of the giving way of the arterial wall in the second; and of the intimal hypertrophy in the third. It also shows that the high pressure need not be permanent; an acute rise for a short period frequently repeated will suffice.

It is the arterioles through the body and their tonus which determine the existence of the normal blood pressure. Heightened blood pressure in the larger vessels means increased contraction of the arterioles of important areas. It is then to changes in the arterioles and smaller arteries that we must eventually look for the explanation of the hyperpiesis. It is by contraction of the arterioles that adrenalin, digitalin, barium chloride, and the other raisers of blood pressure produce their effects. Indeed, in this contraction we have the elements necessary for the establishment of a vicious cycle. As shown by Leonard Hill, the arteries react normally to increased internal pressure not by dilatation, but by contraction; the higher the blood pressure the more contracted do the smaller arteries tend to become. If the heart responds to the increased

work thrown upon it, the higher still becomes the blood pressure. Along these lines it will be seen that rise of blood pressure tends, in the first place, to throw increased work upon the musculature of the smaller arteries; tends, that is, to cause their hypertrophy. If the rise is progressive, then this hypertrophy gives place ultimately to exhaustion, muscular degeneration, and dilatation of the arteries and arterioles. As a result, strain hypertrophy of the intima shows itself by *thickening*. This thickening may also involve the adventitia, resulting in chronic periarteritis. And now, with continued degeneration of the medial muscle in those muscular arteries, fibrosis of the media may also show itself. I would thus regard muscular hypertrophy of the arteries and fibrosis of the different coats as different stages in one and the same process. Whether these peripheral changes are the more marked, or the central, depends, I would suggest, upon the relative resisting power respectively of the elastic and of the muscular arteries of the individual.

Lastly, Klotz has shown experimentally, and it has been confirmed by Saltykow, that certain bacterial toxins, *e. g.*, the diphtheritic, lead to medial degeneration; others, like typhoid toxins, have no recognizable effect upon this coat, but induce a primary intimal proliferation. Adami has some doubts as to the frequency of this agency as a cause of extensive arteriosclerosis in man. When it is at all well developed, the superficial intimal overgrowth cuts off the due nutrition of the musculo-elastic layer, and, indeed, of the innermost layer of the media. Degeneration and weakening of these is the natural result, and there is established a vicious circle. The greater the intimal thickening, the greater becomes the weakening of the lower intimal layer, and so of the arterial wall; nor is the full picture of arteriosclerosis attained until both events are present.

The Clinical Types of Arteriosclerosis. H. A. Hare, in two short pages of the *Therapeutic Gazette*, 1909, p. 853, "On Changes in the Vascular System and their Bearing on Treatment," has succeeded in placing before us a series of views which are so suggestive that their full discussion would occupy more space than stands at our disposal. We may at least offer a few comments upon the chief propositions seriatim.

For clinical purposes he admits three great classes: (1) Far advanced *atheromatous change with calcareous deposits* and associated destructive disease of the intima; (2) *fibroid change*, in which the most important lesion is an arteriocapillary fibrosis; (3) *vascular spasm*, whereby the elasticity of the vascular walls is impaired almost as much as when an actual organic lesion is present.

In contrast with views generally current, he doubts whether, in all cases, the last-named condition exists first as an antecedent, and the advanced condition merely as a final stage. He rather holds "that the class of cases characterized by calcareous change with breaking down of the intima is quite a different type of disease from that characterized by spasm, and later by spasm and arteriocapillary fibrosis."

The value of this distinction is that it brings into the etiological discussion the all-important principle of the directive influence of the mode of function upon the kind of lesion, which is further developed in the next proposition: "It is exceedingly rare, in my experience, to meet with marked calcareous change or brittleness in the arterial system of the well-to-do or upper class, and comparatively rare to find high tension due to spasm and fibrosis in the working classes."

Much weight attaches to this statement, as Hare informs us that he had noted this fact many years before, and has confirmed it by further observation. In this he has a clear advantage over any pathologist looking at the specimen apart from the history.

We must, of course, bear in mind the obscuring influence of a variety of factors. In the first place, as to our methods of inquiry. Most of our clinical observations are taken at the radial artery, but this artery has a behavior of its own in the scale of arteries. How other arteries may have been behaving is not ascertainable until after death. Again, in the postmortem room we are dealing in large preponderance with the working class, and the frequency of the occurrence among them of so manifest a lesion would tend to impress itself more than the frequency of its absence. The upper classes do not offer us the same ample opportunities for postmortem verification.

Additional complicating factors are found in the influence of *syphilis* and of *alcoholism*. Even if the incidence be assumed to show the same percentage in all classes, there are circumstances which probably disturb the evenness of the results in the upper and in the lower class respectively. A long-continued and thorough treatment of syphilis is less likely to be the rule in the latter, while the toxic influence is in them much reinforced by the factor of strain. Again, as regards alcohol, the habitual use of malt liquor has tendencies of its own more definitely inimical to the bloodvessels. Not only do the bulkier potations keep up a greater arterial volume, but the plasma provided as food to the extravascular arterial tissues carries, besides alcohol, another poison in disguise, that of a perpetual carbohydrate surcharge; and to this is likely to belong a considerable share of the result.

The localization of disease in different arteries, according to the avocations of the individual, is even more manifest than the difference in its kind. Calcification of the cerebral arteries and of the coronaries is probably more common in the upper classes than among laborers, judging from the frequency of apoplexy and of angina pectoris among the former, and it is often unaccompanied by any advanced calcification in the radials or in the iliacs and their branches which are so commonly affected in laborers. In short, hard mental labor and nervous stress predispose to disease of the cerebral and of the coronary arteries, hard manual labor to disease of the muscular arteries. In both instances there is local vascular strain and, as a result, local arterial hypermyotro-

phy; but probably much more of the latter where the strain was of the muscular order. As Klotz's researches have proved conclusively that calcification begins and is carried out mainly at the expense of the muscularis, the relative predominance of this form of degeneration in the radial artery of the laborer is satisfactorily explained. It should be borne in mind that, in his case, the continuous strain begins at a relatively early age, when its stimulus calls forth a readier response of hypertrophy. In this connection I called attention at the Toronto Meeting, in 1906, to the thickening of the radial, which I had observed in juvenile servant maids of seventeen and upward, and which contrast with the freedom from thickening in many aged ladies.¹ Arteries hypertrophied so early in life are predestined to calcification when degenerative changes set in.

It is further pointed out that as the prospect of improvement under treatment is much less discouraging in the fibroid than in the calcareous variety of arterial disease, a correct diagnosis is indispensable. But the same duty is never absent in the presence of any form of acute seizure. "The recognition of the underlying vascular state, altered by acute illness, is therefore of the utmost importance from the standpoint of prognosis, and of even greater value from the standpoint of therapeutics."

In connection with diagnosis, Hare insists that it is "not safe to be content with the examination of one vessel in determining the general arterial state. It is by no means uncommon to find pathological lesions of different degree in the same vessels on each side of the body, and vascular anomalies may often mislead us."

Again, "sometimes the vessels of the celiac axis are atheromatous, whereas those of the periphery have escaped in great degree, and this holds true of the coronary vessels with force. An examination of the deep vessels as far as possible and the use of the ophthalmoscope to determine the state of the vessels of the retina, which are often excellent indicators of vascular change elsewhere, are of great importance in addition to the use of instruments of precision, including, of course, the sphygmomanometer."

"How many cases of so-called cardiac disease depend in reality upon cardiac fatigue due to vascular disease? How many cases of supposed dyspepsia and abdominal pain have their origin in disease of the abdominal vessels, and how many cerebral symptoms and renal symptoms rest upon a similar basis?" Finally, Hare reiterates his warning against ill-timed digitalis when nitrites are wanted, and tells us "not to give the tired horse an extra meal and then double its load."

Time, Tension, and Toxins, the Three Factors of Arteriosclerosis With characteristic felicity of expression, Professor Osler's address at Oxford on December 8, 1909, endowed some of our old themes with the charm

¹ Edinburgh Medical Journal, 1906, vol. ii, p. 206.

of novelty. *Time* is acknowledged to be in itself a sufficient cause. It is the *ultima ratio* which in the absence of any other agency will decide the fate of the arteries and of their owner. But neither in the date nor in the variety of the decay can any uniformity be traced. The degeneration may be purely a senile event; but sometimes long delayed. The adverse influence of heredity may hasten its advent, even within the limits of middle age. This is largely a question of "the quality of the rubber tubing." Much, however, will depend upon the use which is made of it. The best material will not resist persistent bad usage, and vessels are not made for constant stress. "High tension" is the functional factor. We find it at work in the life as well as in the artery. When the candle has been kept burning at both ends, "there will be knocks at the door and creditors will appear in the shape of dyspnea, angina, and the like."

But apart from any fast living, the artery may be ruined by excessive *muscular tension*. Cavalrymen are liable to popliteal aneurysm; and right-handed workers are more prone to arterial disease in the right arm than in the left. Strict experiment has shown that in rabbits suspended head downward for a few minutes daily for 140 days sufficed to produce marked arteriosclerosis in the vessels of the upper part of the body (Klotz).

Of the toxins, the endogenous are the more important. Waste products, like clinkers or ashes, irritate the endarterium, and keep the tension high. "Too much food eaten as if we were stoking our engines to draw the Edinburgh express, and then put them in the station yard or to draw trucks. Quakers, temperate in drink, are not so in food, and are especially liable to arteriosclerosis. The theories of intestinal intoxication as promulgated by Metchnikoff, and earlier by Glisson, have led to the lactic acid and sour milk treatment. *Of the exogenous toxins*, those of the specific fevers are the most important, and could cause degeneration, even in children. Then there is the large subject of syphilis. Alcohol, tea, coffee, and tobacco are other types of exogenous toxins. For those with tendencies toward arteriosclerosis, the guiding motto is: 'Nothing too much'—the life of the tortoise, not that of the hare. Success is largely a matter of survivorship."

An early diagnosis of arteriosclerosis may be based, according to Engel,¹ upon the *differential observation of local variations* in the pressure readings, if these shall be found to be constant. The differences vary up to 15 mm. of mercury only, and need, therefore, careful determination. In high pressure from simple nephritis the factor "pressure" is the only quantity; but in arteriosclerosis there is in addition the factor of the "local caliber" of the diseased artery. A much reduced caliber would cause a permanent loss of pressure in the area served by it; and, by this, arteriosclerosis would be known to exist and be made demonstrable.

¹ Berl. klin. Woch., September 20, 1909.

The Treatment of Arteriosclerosis was considered at some length in our last September's report in connection with Goldscheider's work, and must be briefly dealt with here. Passing over Strasser's recently published views upon the physical and the dietetic treatment, we find that Aufrecht, who attributes the disease to an obliteration of the vasa vasorum, is in favor of iron rather than potassium iodide, and has treated patients satisfactorily for months and years on a reduced iron pill, with intervals of rest for half or a full month. Sir James Barr, in his lecture on the peripheral circulation, dwells upon various aspects, and particularly upon the ordinary sedative warm alkaline bath, the stimulating carbonic acid bath, and the Nauheim bath in which, he believes, calcium chloride plays a very empty part, in spite of the much which has been made of it—potent only and dangerous if it could be absorbed. Baths of all kinds need care and judgment. In advanced arteriosclerosis, they need great moderation if they are to be kept free from risk.

EUSTENIN, A REMEDY FOR ARTERIOSCLEROSIS. In a paper upon arteriosclerosis and allied conditions,¹ Sidney H. Hall dwells chiefly upon the treatment, and speaks with unfeigned warmth of the virtues of eustenine, a blend of about 51 per cent. theobromine and 43 per cent. sodium iodide, in doses of from 7 to 12 grains, twice daily. He has found the remedy most useful also "in many other conditions, some concurrent with arteriosclerosis, such as angina, myocarditis, asthma, and emphysema, as well as in conditions which were apparently independent of vascular changes, such as pleural thickening, long-standing bronchial catarrhs, and certain manifestations of gout and rheumatism."

After detailing five clinical cases, he concludes: "So far as drugs are concerned, my faith in the combined iodine and theobromine treatment (as afforded by eustenine) of all conditions included under or accompanied by arteriosclerosis is now practically immovable, and I commend the method cordially to those who have not already tried it."

ANEURYSM.

Syphilis and Aneurysm. W. Osler's Schorstein lecture² is historical, philosophical, pathological, and practical. The *origin of aortic aneurysm* is to be traced to *mesaortitis*, so different from common chronic aortic degeneration, both in its localization, usually just above the valves or involving them, and in the scarring and puckering which justify the term "cicatricial or fibrous aortitis." Although ulcerative, the common atheromatous disease does not often produce aneurysm, and therefore old age is free while the middle decades of life suffer.

¹ Med. Press and Circ., November 10, 1909.

² British Medical Journal, 1909, vol. ii, p. 1509.

The mechanism of the aneurysmal bulging at the seat of the patch of mesoarteritis is one of three: (1) Acute necrotic erosion; (2) splitting of the intima over the weakened spot, spontaneously or as the result of strain or effort; or (3) the more gradual weakening and dilatation leading, as in the rabbit poisoned with adrenalin, to multiple pouchings.

Among the *clinical features* are the tendency to perforation, whether in the brain or nearer the heart, and to sudden death. In the second place this is the aneurysm of the third and fourth decade, and is apt to form the triad "angina, aortic reflux, and aneurysm." Lastly, there is the feature of amenability to potassium iodide, especially marked in presence of that triad.

Four lines of attack against the fatal foe are recommended by Osler: (1) A healthy education of our youth in matters sexual; (2) steps to lessen "the sight of means" so flagrantly exhibited in our towns; (3) registration and supervision; and lastly (4) increased facilities for early and prolonged treatment.

The Pupil Sign in Thoracic Aneurysm. W. Osler's short but forceful lecture in the *Practitioner* for April, 1910, reminds one that the pupillary signs deserve at this date a less elementary description than that previously allotted to them "as a result of irritation of the sympathetic by pressure," by writers such as Sir Wm. Gairdner, in his *Clinical Medicine*, and in the first edition of Allbutt's System, and by Ogle in his classical article in the *Royal Medical and Chirurgical Transactions* for 1858. The matter is not quite so simple, and it is analyzed by Osler under the headings: "(1) Cases due to the involvement of the sympathetic nerve; (2) cases due to changes in the vascular condition of the iris; and (3) cases of the Babinski syndrome—the association of pupil symptoms, aneurysm, and tabes."

1. As regards the first, postmortem evidence of direct aneurysmal compression of the sympathetic cord is rarely found. Conceivably, however, there may have been irritation. "Clinically, in the great majority of all cases of aneurysm, pupil features are present without other indication of the involvement of the sympathetic system. Only in a few instances, in my experience not more than four or five, were there other signs, such as flushing and sweating of one side of the face, ptosis, and retraction of the eyeball." Where any complications do occur, "unilateral flushing, increased heat and sweating, with mydriasis are less common than myosis with profuse sweating, and occasionally slight ptosis. The arm may be involved, and I have seen the skin of the hand wrinkled like that of a washerwoman; but these are very rare cases."

2. With reference to the second group, Osler starts from the well-known facts of the widened pupil associated with a lowered blood pressure, and of the small pupil of abnormally raised blood pressures. In the case of aneurysm, Wall and Ainley Walker¹ have attempted to

¹ Lancet, July 12, 1902.

explain the anisocoria as due in most cases to an inequality of the blood pressure in the two ophthalmic arteries. Their explanation itself rests upon a theory explaining "the relationship between the arterial blood pressure and the size of the pupils by the anatomical peculiarities of the vessels of the iris. As Waller originally showed, "they are spiral or zigzag, so that during contraction or dilatation their lumen is not changed in caliber. It is a well-known physical fact that the raising of the pressure in a fluid tends to cause elongation and straightening of the tube. From this it follows that a rise of blood pressure in the spiral bloodvessels of the iris would tend to lengthen them and lead to narrowing of the pupil, and *vice versa*, a fall in the blood pressure to shortening of the vessels and enlargement of the pupil." Local variations in blood pressure occur in aneurysm. The radial pulse on one side is often smaller, and inequality of the carotid and temporal pulses is by no means uncommon. In 26 cases of thoracic aneurysm in which notes were made concerning the relative size of the radial pulse and of the pupils, these authors found in 11 the radial pulse was larger on the side on which the pupil was smaller; so it does not necessarily follow that because there is inequality of the radial pulses there must be a similar inequality in the ophthalmic arteries. They studied and compared the relative sizes of the temporal arteries, and found that in all their cases the smaller pupil corresponded to the larger temporal pulse. Experimentally, digital compression of one carotid sufficient to abolish or partially arrest the temporal pulsation, was associated with gradual enlargement of the pupil on the same side, followed a little later by enlargement of the pupil on the other side. They attributed the dilatation on the same side to the immediate fall of pressure in the ocular vessels, which results from the compression of the carotid. The gradual enlargement on the other side is due to the general fall of pressure in the circle of Willis, which results from the same cause. Osler believes that this explanation holds good in a large proportion of all cases of aneurysm of the thoracic aorta.

3. The third group is to be regarded as one in which the pupil sign belongs to tabes and the tabes to a syphilitic origin as well as the aneurysm. The whole syndrome is "part and parcel of a syphilitic infection."

A New Portable Mercury Sphygmometer. Yet another instrument has been invented by Leonard Hill, for the determination of the pulse pressure. It is described in the *British Medical Journal* (1910, vol. i, p. 442). Its portability and small size and its simple construction are obvious advantages which, in the absence of any striking defects, should insure for it much popularity. This mercury manometer, made by Hicks, of 8, Hatton Garden, E. C., consists of a single tube, the lower end of which is sealed into a small reservoir, and, as is shown in the enlarged figure, opens near the bottom of this part of the instrument. The armlet tube is attached to the end of the glass tube, which is also

sealed into the reservoir, and opens into the upper part by a capillary opening. A small quantity of mercury is introduced into the reservoir, and the mercury is driven up the manometer, and registers the pressure on a scale in millimeters of mercury. The slight fall of the mercury in the reservoir is taken count of in the graduation of the scale.

When in use the manometer is fastened to the wooden thermometer case in which it is carried by a rubber ring, and a simple little brass foot is screwed on the end of the case, and supports it in the vertical position. The brass foot folds up, and goes into the case beside the manometer.

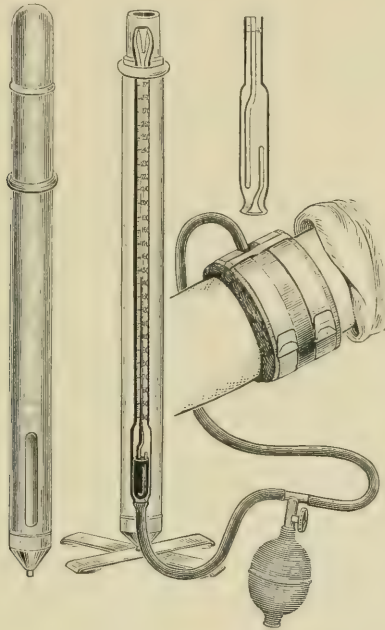


FIG. 17.—A new portable mercury sphygmometer.

The advantages of the instrument are: (1) A single tube; this halves the errors of reading the ordinary double-tube manometer. (2) Owing to the capillary opening, the mercury does not spill. No rubber caps are required to close the manometer, and it can be carried in its case in any position. (3) Portability. No box is required; the wooden case, armlet, and bulb can be thrown into a handbag, and thus carried conveniently.

A Clinical Apparatus for Obtaining Graphic Records of Blood Pressure. This useful instrument, which was demonstrated by Charles Singer¹ before the Physiological Society, is intended for the double purpose of facilitating a reading of the *diastolic*, as well as of the systolic pressure, which is alone given by the various sphygmomanometers in general

¹ *Lancet*, February 5, 1910.

clinical use, and of furnishing a *graphic record* which they do not supply. For physiological study in the laboratory, several recording sphygmomanometers have been constructed, such as Joseph Erlanger's and G. A. Gibson's; but they are either not entirely free from the influence of the personal factor, or they secure the needful accuracy only at the cost of considerable complication which renders them cumbrous, heavy, and unsuitable for clinical work. This objection does not apply to the present instrument, made by T. Hawksley & Son, as it fits into a case the internal dimensions of which are $14\frac{1}{2} \times 5 \times 4$ inches. The instrument is light enough to be easily carried in the hand and is therefore adapted for clinical as well as laboratory use.

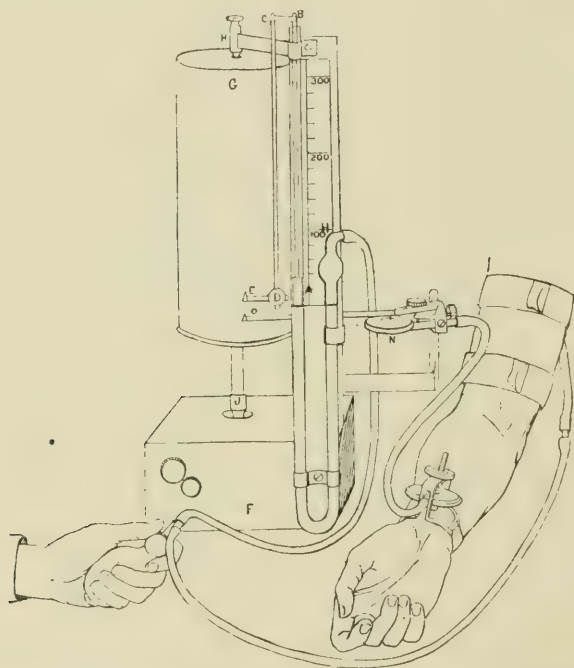


FIG. 18.—A new form of self-recording sphygmomanometer for clinical use. For lettering see text.

The illustration conveys a sufficient explanation of the general construction of the manometer which is planned on the Hill and Riva-Rocci principle, with inflatable armlet for the upper arm and suitable fittings at the wrist. The mercurial manometer is of the uniform U-shaped type adopted by Dr. C. J. Martin¹ in his modification of the Riva-Rocci instrument, and its lumen is that recommended for the physiological kymograph by von Kries,² viz., 4 millimeters in diameter. The mercury

¹ British Medical Journal, April 22, 1905.

² Von Kries, Archiv f. Anatomie und Physiologie, 1878.

when at rest reaches to the zero of a vertical scale 150 millimeters long, graduated so that each $\frac{1}{2}$ millimeter length on the scale is marked as a whole millimeter (see *H* in Fig. 18).

The recording apparatus is as follows: On the surface of the mercury in the open limb of the manometer there rests a light ivory float (*A* in Fig. 18). On this is fixed a very light but rigid upright, which emerges from the top of the open limb, and is bent on itself at *B* and *C*, while attached at *D* is a light pen *E*, which writes in ink on a revolving cylinder, *G*. The closed limb of the manometer, *H*, is connected by a thick rubber tube with an air-cushion which completely surrounds the whole girth of the upper arm, and which is held in place by an inelastic leather cover secured by straps. Within the armlet and air space above the closed limb of the manometer, pressure can be raised and lowered at will by means of an india-rubber air-pump provided with a T-piece and liberating screw (Fig. 18).

Pulsation in the radial artery is recorded by a second pen (marked *O* in Fig 18), which writes on the cylinder vertically below the first. The second pen is moved by a tambour, *N*, connected by a pad on the radial pulse by a second tube. This pad consists of a small india-rubber sac filled with fluid and fixed into a hollow metal cup, the apex of which opens into a tube connected with the tambour. The pad and cup are not shown in Fig. 18, where an older form of tambour has been represented. They are attached to a light adjustable frame, by means of which the pad can easily and rapidly be brought into contact with the radial pulse with any required degree of pressure.

The procedure is of the usual kind. The upper arm of the subject on whom the observation is being made is compressed until the pulse in the wrist below ceases. Pressure is then gradually reduced until it is equal to, or slightly lower than, the force exercised by the heart during systole, so that the pulse can again be felt. The pressure which permits pulsation to first reappear is read on a mercurial manometer to which a scale is attached. As the pressure is still further lowered the mercury in the manometer shows marked oscillations, and the point at which these are of greatest amplitude is to be regarded according to most writers as the diastolic pressure.

In using the instrument, the revolving cylinder, which is detachable, is surrounded by a sheet of paper held in place by two elastic bands. The pens are inked with methylene blue ink and apposition to the cylinder secured in the case of the upper one. (This can be done by placing the apparatus very slightly out of the vertical, as by putting a coin or other small object underneath the front of the clockwork base.)

A horizontal line, the abscissa of Fig. 19, is traced and the armlet is then put in place and secured. The pad is now fixed to the wrist over the radial artery in such a way as to give a maximum movement of the tambour. Lastly, the lower pen is adjusted so as to write on the

cylinder and the latter is set revolving. Pressure is now raised within the armlet (the upper pen rising in indication) until the pulse at the wrist ceases to beat, as shown by the immobility of the lower pen; and finally, when this condition has been secured, pressure is gradually and uniformly released until the atmospheric level is again reached. The cylinder can now be stopped and the record removed and examined.

The type of tracing yielded is shown in Fig. 19. The straight portion which forms an interruption in the lowest line (which is derived from the radial pulse) represents the period during which the pressure on the upper arm was so high that no pulse was able to reach the wrist. The irregular line above the abscissa records the varying pressure in the armlet as represented by the height that the surface of the mercury in the open limb of the manometer is from time to time above its position of rest. The oscillations represented on this line correspond to the pul-

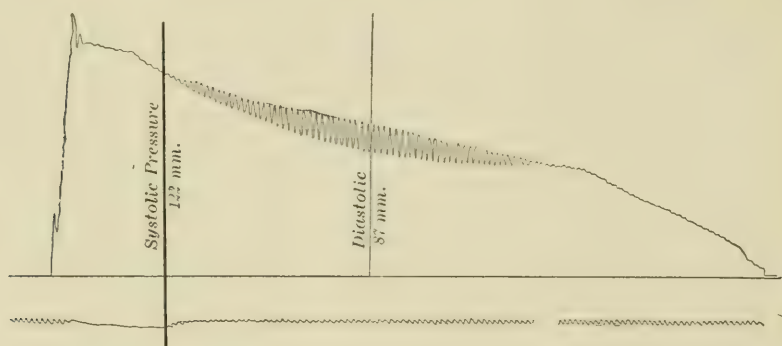


FIG. 19.—Systolic pressure, 121 mm.; diastolic pressure, 87 mm.

sation in the upper arm, which increases and eventually again decreases as the pressure is gradually lowered. These excursions are at their maximum when the pressure on the arm is equal to the internal pressure on the brachial artery during diastole.

To read the *systolic pressure* from the record, the point is taken at which pulsations first show themselves on the tracing derived from the radial artery after the pressure on the upper arm has been sufficiently released. The distance between the abscissa and the upper line, in the same ordinate as this point, multiplied by two, gives the mercurial pressure which the force of the heart during systole is just able to overcome—*i. e.*, the *systolic pressure*. To obtain the *diastolic pressure* the vertical distance between the middle of the largest oscillation in the upper line and the abscissa is measured, and multiplied by two. This result is also expressed in terms of mercurial pressure.

The Treatment of Low Blood Pressure is not often referred to. Sir Lauder Brunton¹ alludes to its indications. When it is down to 80 or 90,

¹ British Medical Journal, July 10, 1909.

rest in bed is usually required, with nutritious diet, beef tea, cardiac tonics and stimulants, such as strophanthus, caffeine, nux vomica, or strychnine; gentle massage and graduated exercises in bed, iron in some form, if tolerated. Rest may be necessary with a tension of 100 to 110 mm., but, on the other hand, the tension in cases of commencing phthisis may be as low as 90, without any heart indication. Low tension is therefore not an absolute indication any more than a very slow pulse.

Influenza and diphtheria are great weakeners of the heart muscle. After influenza, unlike typhoid, the convalescence is often cut short, and the heart weakness may last for years. In the slighter cases, likewise, as they are apt to be overlooked, cardiac overstrain may readily occur.

For *high tension*, Brunton's teaching is well known. As a peculiarity, high tension may mean great and untiring energy; but, as a pathological development, it is often to be identified by the accentuated second sound and the systolic aortic murmur of atheroma. The supervention of a mitral murmur indicates a pathological safety-valve leakage analogous to that of King's physiological safety-valve action of the tricuspid. This relieves some of the tension and may save from cardiac failure or apoplexy. The resulting moderate tension, say of 150, is enough in these cases to forbid tea, coffee, alcohol, hurry and worry, emotion and anger. The risk is in the hurry; but quiet exercise is good.

Medicinally, a powder of 10 grains of sodium bicarbonate and of potassium nitrate, with $\frac{1}{2}$ to 2 grains sodium nitrite, may be taken every morning for years in some hot or some aperient mineral water. A $\frac{1}{4}$ to $\frac{1}{2}$ grain tablet of nitro-erythrol may be added—and if necessary, repeated in the day. Any chest pain upon exertion calls for a nitroglycerin tablet, which should be always in the pocket. Failure of cardiac reserve power often needs strychnine, guarded by strophanthus or digitalis to avoid any strychnine distress or palpitation.

In the first resort, it is the blood which requires to be treated, by diet, by calomel or blue pill once, twice, or thrice a week; by potassium or sodium iodide or their organic preparations; and these remedies are also good for the thickened vessels. The undoubted pressure-lowering effect of high-frequency currents, and perhaps of static electricity, has not been perfectly explained, and is probably complex in its mechanism.

The Treatment of High Blood Pressure is dealt with by George Oliver¹ in two sections, the physiological or drugless treatment, and the medicinal.

1. THE PHYSIOLOGICAL TREATMENT BY DIET AND HYGIENE. *In diet*, the cardinal aims are (a) to reduce the bulk and the number of the meals, *e. g.*, a nominal or put-off lunch; (b) to exclude or lessen red meats, especially when roasted, and to avoid meat extractives (soups and gravies); and (c) to give freely vegetable-derived foods—fruits, green vegetables, and farinacea—and the non-nitrogenous articles of diet.

¹ Medical Press and Circular, February 2, 1910.

Butcher's meat in high-pressure cases may be injurious from three probable causes: (a) The cardiovascular stimulation of the extractives they contain; (b) increased intestinal putrefaction. Recent experiments having shown that pressor products (acting somewhat like adrenalin) are derived from the putrescence of animal proteid, perhaps similar bodies may be split off from the complex protein molecule in the bowels, should the pepsin of the intestinal juice be deficient; (c) the diminution of nitrogen excretion in the elderly may also be an important factor in producing toxemia.

As boiling removes the extractives, boiled meats may be preferable.

"Salt, when taken beyond a moderate allowance, such as 100 grains *per diem*, is a circulatory stimulant, and increases the tissue lymph flow; and thus it concentrates the blood and increases its viscosity. It is not improbable that in this way the arterial blood pressure is raised by a rich diet in salt.

"A *salt-free diet* consists of vegetables, fruits, nuts, fats (fresh butter, cream), salt-free bread, farinacea (potatoes, rice, peas), sugar. It is most useful for a week or two at a time when the blood pressure rules high, and especially when absolute rest is enjoined.

"A *pure milk diet* (5 or 6 pints daily, well distributed) is most useful in high-pressure cases when combined with rest; and it is also valuable for a few days or a week during periods of increments of pressure."

Bulgarian milk and *Bulgarian buttermilk* are more antiseptic than ordinary milk. *Buttermilk* (prepared from skimmed milk) is better borne in continued administration than the unskimmed preparation, 1 pint daily, a third being taken with sugar at each meal. This treatment goes well with 2 pints of ordinary milk and cooked vegetables, macaroni, bread, rice, etc., cooked fruits of all kinds, nuts, cream, butter, fresh cheese (avoiding stale and microbic cheese), cream cheese, and eggs cooked in any form.

Coffee, tea, and alcohol should be limited, and in certain cases excluded.

Tobacco smoking should be limited strictly when the habit cannot be given up.

As to fluids, it is best to order a tumbler of water (preferably warm and with lemon juice, or half a teaspoonful or so of citrate of potash), to be sipped an hour before meals and also at bedtime.

The treatment of flatulence and other indications of dyspepsia is important.

Warm baths are valuable depressor remedies; and an annual course of balneological treatment at a well-equipped watering-place is most useful in many cases. Rest and exercise should be well distributed. Exercise, up to the individual capacity and without strain, should be encouraged, for exercise is followed, as a rule, by a fall in blood pressure. Slow, self-induced tension of the muscles of the arms and then of the legs, lasting a minute, with measured intervals of absolute rest, should be

practised for several minutes at a time two or three times a day. Slow, deep breathing exercises (four or five respirations a minute) are also useful in reducing arterial blood pressure.

Warmth in clothing and climate also lowers arterial pressure, and high pressure cases do well to obtain an equably warm winter climate, such as that of Jamaica, Egypt, and India.

The Psychological Treatment is most important. High-pressure cases are apt to become unduly anxious about themselves, therefore always, if possible, try to give the impression that all is well.

2. THE MEDICINAL TREATMENT. *Depurant Treatment of the Bowels.* In the elderly there is a tendency to a too complete, or rather too prolonged, digestion in the bowels, the feces becoming drier than in earlier life, and the colon is disposed to elongation and increased sacculation. Then the habitual use of a dinner pill becomes useful as an aid to the lagging bowel.

Regulin consists of agar-agar (Japanese isinglass made from a seaweed), with a small percentage of cascara; the former passing into the bowel, excites a flux of fluid which softens the feces and the latter aids the laxative effect and tones the intestinal muscular fibers. It is said we may use regulin for months with unimpaired effect. In addition to this, high-pressure cases may also benefit from a grain or two of calomel or blue-mass once or twice a week at bedtime, and a saline aperient the following morning.

Potash salts are generally well borne. The most useful are the citrate, the iodide, the nitrate, and the bromide.

The benzoates and hippurates have been prescribed for five years in a large number of cases of supernormal pressure, and the effect was generally most favorable. They may be continued indefinitely without injurious effects.

"The *nitrites* should be held somewhat in reserve for extra-resistant cases, for acute increments of pressure, and for such emergencies as angina. It is best to rely chiefly upon the nitrites possessing a slower and a more prolonged action, such as sodium nitrite, erythrol tetranitrate, or mannitol nitrite. Oliver has obtained excellent results from a tabloid of sodi nitrit., gr. $\frac{1}{2}$; erythrol tetranitrat., gr. $\frac{1}{4}$; mannitol nitrit., gr. $\frac{1}{4}$; ammon. hipp., gr. 1. One or two may be taken for lengthened periods, when the dose is omitted for a few days or a week in each month.

"*The response to treatment* varies very greatly; in many cases it is practically nil, or is only temporary when the pressure is the outcome of renal disease. This should be met by free purgation, active perspiration, recumbent rest, a pure milk or salt-free diet, and a somewhat firmer use of the nitrites."

In the most impressionable cases the urine is, as a rule, albumin-free. If the pressure falls and if the pulse and breathing become more disturbed by exertion, and edema, however slight, supervenes, we should combine

a cardiac tonic, such as digitalis or strophanthus, with the depressor remedies, or we may rely upon the cardiac tonic treatment alone. Then we may infer that the supernormal pressure is a compensatory condition, being absolutely necessary to insure the requisite speed of the capillary blood flow.

Relative Merits of Vasodilators. A comparative study of the relative merits of vasodilators has been undertaken by Matthew in the *Quarterly Journal of Medicine* (April, 1909), and is summarized in the *Therapeutic Gazette* (p. 570). A general idea of most of the points determined may be gained from the following diagram (after Bradbury). But

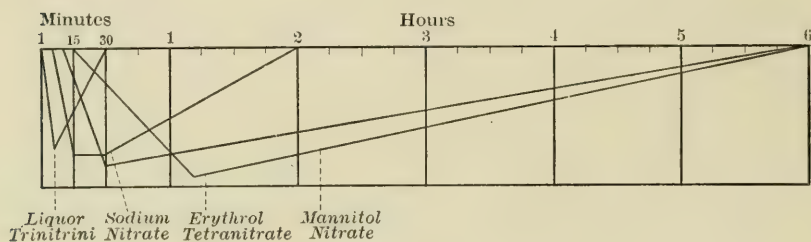


FIG. 20

Matthew, in his important paper, points out that the normal action of any and all of the nitrites may be quite absent or suspended, owing to the individual condition, as, for instance, in advanced Bright's disease and during the prevalence of cardiorenal edema.

DERMATOLOGY AND SYPHILIS.

By WILLIAM S. GOTTHEIL, M.D.

DERMATOLOGY.

Auto-intoxication in Diseases of the Skin. Signs are apparent of a reaction against the theories so long held by the Vienna school, and by them imposed on general dermatological opinion, by which dermatoses are regarded as purely local affections of the skin, and in but few instances etiologically connected with internal conditions, or general systemic influences. These ideas have been of the greatest value in the development of the specialty, since they have for years kept the attention and research of dermatologists fixed upon local disease changes and local therapeutic measures. The time seems approaching, however, when the limits of effort in this direction will be reached; the etiology of a very large number of dermatoses is still unknown; and in many others our methods of treatment are still very defective.

Under these circumstances it is quite natural that the attention of investigators should be turned to those more general processes which we know affect organs individually, to which it is hardly likely that the skin is an exception. Particularly is this the case with the auto-intoxications, the importance of which Bouchard has taught us, especially those from the intestinal canal. The estimation of the indican in the urine affords a ready means of ascertaining the amount of intestinal putrefaction that is going on. It is, of course, dependent to some extent upon the diet. It may be present, as is well known, in healthy individuals, but its permanent appearance in large amounts is satisfactory evidence of the existence of abnormal intestinal processes, and the possibility of auto-intoxication.

Lichtenstein¹ has recently published some extensive investigations upon this subject. Without going into the details of the methods that he employed, a résumé of his results will be of interest. In view of the facts that normal individuals may show indican at certain times and under certain dietary conditions, the examinations were made repeatedly in each case, and slight or medium reactions were excluded, or counted as negative. All cases showing other conditions that might occasion indicanuria, such as obstructions of the gut by foreign bodies or tumors, incarceration, paralysis of the intestines from gallstones, inflammations and contusions

¹ Dermatologisches Centralblatt, January, 1910.

of the testicles or ovaries, ileus after laparotomies, hernia operations, puncture for ascites, peritonitis, thrombosis and embolism of the mesenteric artery, infections, etc., were naturally excluded. The following were the results in the 258 cases examined as regards excess of indican:

	Cases.	Positive.	Per cent.
Psoriasis	49	20	40.8
Chronic eczema	31	13	42.0
Acute eczema	17	6	35.3
Erythema multiforme	11	6	54.5
Lichen planus	11	5	50.0
Rosacea	9	4	50.0
Acne varioliformis	8	4	50.0
Acne vulgaris	25	10	40.0
Chronic lichen	19	8	42.0
Acute urticaria	9	5	50.0
Chronic urticaria	17	7	43.5
Infantile prurigo	7	3	50.0
Seborrheal eczema	23	7	30.5
Pruritus	22	2	9.0
	258	100	

With the exception of pruritus, in which the proportion of positive cases was noticeably small, it may be broadly stated that in these cases 50 per cent. suffered from abnormal intestinal putrefactive processes. This does not necessarily mean that intestinal putrefaction was the cause of the dermatoses which were present, but in certain of them, such as the urticarias, the connection between the two processes is notorious. Even in the other cases, however, Lichtenstein is inclined to believe that the toxic materials absorbed by the blood are deposited in, or excreted by, the skin, and by lessening the resistance of that organ, render it liable to injury by other noxæ. As a matter of fact, we find that in many of these dermatoses the skin condition improves and gets worse again *pari passu* with the state of the gastrointestinal tract.

Sobolew has recently undertaken a series of experiments similar to the above, and with the same general results. He found that indicanuria was marked in acute and chronic urticaria, and in chronic eczema. In such affections as acne vulgaris, lichen planus, etc., intestinal disturbances always occasioned an exacerbation of the eruption.

In this country, White believes that he has evidence of the intimate connection between dyspepsia and dermatoses. He found that condition present in the following proportions: Rosacea, 71 per cent.; acne, 55 per cent.; eczema, 64 per cent.; seborrheal eczema, 85 per cent. Of course, it is not to be presumed that the intestinal tract is the only source of auto-intoxication, but it is probably the chief one. The entire subject is well worth the renewed study that it will doubtless soon receive.

The Bier Hyperemic Treatment in Dermatology. This method of treatment has now been before the profession for several years, and it is quite extensively employed by some surgeons, with good results. I have been using it habitually in certain obstinate dermatoses as an adjuvant to other measures, and I have seen good results from it. As employed in general surgery, its object is to obstruct the venous flow without interfering with the arterial circulation, thus causing: (1) Increased blood supply to the diseased area and the surrounding tissues; (2) increased local leucocytosis; (3) increased local exudation; (4) increase of the opsonic index. There are two chief methods of attaining these ends: The venous outflow may be obstructed mechanically, effecting a more or less lasting, passive, or venous hyperemia; or an active arterial hyperemia may be produced by the influence of heat or suction. I have used the second method chiefly, employing suction by means of dry or wet cups, since the skin is the most superficial of the tissues, and the face is the area most frequently treated.

I can heartily indorse the procedure advocated by Strother¹ in certain common dermatoses. Thus for *boils, carbuncles, furuncles, and abscesses*, he advises careful cleansing of the skin over and around the lesions, incision, followed by the application of a cup with vaselined edges for five minutes. The cupping is done several times in succession at the first session, with an interval of several minutes between each cupping. The process may be repeated each time a dressing is applied, although it should be less vigorous than at the first. One very important point in the treatment of these infections I must insist upon, more especially when the lesions are multiple or successive. I am convinced that local inoculations are responsible for their appearance, and the prevention of this is of vital importance. Shaving of the whole area, the most careful cleansing, and the constant application of an antiseptic dressing made as nearly occlusive as possible, is my rule of treatment. Even on the neck, a wet boric acid or mild bichloride dressing may be so applied as to prevent further infection. The treatment is also applicable to *infected wounds, stitch abscesses, small ulcerations*, etc.

In *acne*, of all kinds, I regularly employ the hyperemic treatment in conjunction with the lance, curette, and local applications. The cupping is done after the mechanical measures, and can be pushed to the production of a distinct ecchymosis lasting a day or two, with advantage. It is well, however, to warn the patient beforehand of the probable or possible results of the treatment.

In *Raynaud's disease, chilblains*, and other *cyanotic conditions*, Arning² recommends the hyperemic treatment. For chilblains and other localized lesions, the cups may be used; but for more general ones, venous hyperemia can be obtained by means of a moderately tight elastic band

¹ Virginia Medical Semi-Monthly, January 22, 1909.

² Monatshefte für praktische Dermatologie, April 15, 1909, p. 361.

high up on the limb. This should never be used sufficiently tight to cause blanching of the limb; the part should become first red and then bluish. The hyperemia may be induced once or twice a day, and kept up for a gradually increasing period of time. It is well to begin with short sessions, say five minutes, and prolong them as we watch their results. I do not permit the patient to employ this measure himself; it should be used under medical supervision. In *chronic dermatitis with ulceration*, the so-called *varicose ulcer*, there is no more effective measure to employ. Many years ago my teacher, George H. Fox, regularly advocated and employed an elastic ligature applied just under the knee in these cases, causing a certain amount of permanent passive hyperemia. At that time the good results from the measure were attributed to the mechanical support afforded to the veins by the interruption of the column of blood at the point where the ligature was applied.

Finally, in *lupus*, Petersen¹ has gotten very good results from the treatment. I have not used it myself in these cases. For lesions of the face, cups would have to be employed. When the extremities are affected the ligature method may be used.

In my office I use a small electric motor pump to exhaust the air from the glass bells used in cupping; a variety of these should be kept on hand to cover various sized areas, and to fit different surfaces. Rubber bulbs can be obtained to fit the bells and the air exhausted by pressure, but this method is neither so manageable nor so effective as a pump. For the compression hyperemia ordinary thin rubber tubing can be employed.

Eye Injuries from Actinic Light. Miller² has recently called attention to injuries of the eyes occasioned by exposure to intense light of short wave-length, a subject of interest on account of the rather extensive employment of naked arcs or high candle-power bulbs in the various lamps used in dermatologic and other therapeutics. I have suffered from it myself, and I know of more than one other instance of practitioners who have employed the method extensively.

The author is more immediately concerned with the acuter form of injury after prolonged exposure, as shown by deep-seated pain in the eyes, headache, and difficulty in focusing. The symptoms may last a considerable time, and may lead to permanent trouble in accommodation and sensitiveness to the short light-rays, probably due to injury of the ciliary body and muscle. It is most liable to occur, of course, from the naked arc, in which the violet and ultraviolet-rays are relatively more abundant than in sunlight itself; in the enclosed arcs and the bulbs the glass cuts off most of the short wave-rays, so that damage is less liable to occur. I am fully convinced that it does occur, however, and I have restricted my work as much as possible in this direction in consequence of it. The subject is well worth further study.

¹ Monatshefte für praktische Dermatologie, April 15, 1909.

² New York State Journal of Medicine, December 1909, p. 510.

Fulguration. With the mechanico-therapeutists (I use the term with all respect) the latest procedure is always the best, and the one that will supersede all others. The X-ray sun is sinking—not out of sight but to take its proper place as a star among the other dermato-therapeutic agents; it no longer replaces and renders unnecessary all other measures in all kinds of dermal diseases. Radium remains where it was a year ago, a possibly useful agent, but not an indispensable one, since all the constantly decreasing claims for what it will do can be effected by other means; it is still a therapeutic curiosity for the very rich. The latest comer in the field is *fulguration*—a term fraught with mystery to many, but which only means the application of the high-frequency spark as a cauterant, using an insulated metallic or carbon electrode for the purpose. All manner of peculiar and vague effects have been claimed for it, but I have been unable to convince myself that its effects are anything more than those of an extremely manageable stimulant and cauterizing agent.

Among the articles that have appeared upon the employment of this agent in dermatology, that of MacKee¹ is one of the most thorough. I may also mention those of King,² Titus,³ Keating-Hart,⁴ Nagelschmidt,⁵ and Gaucher and Leuste.⁶ The conclusions to be drawn from their observations may be summarized from MacKee, as follows:

Carbuncle and Furuncle. The author agrees with Piffard in regard to the efficacy of the high tension spark to abort beginning infections of this nature. I have no doubt that it will do it, provided the cauterization is accurate and thorough. The minute infected area is transformed into a necrotic plug which is soon cast off. I usually employ a small galvanocautery point for the purpose, and have no doubt that the same result can be gotten with a glass point dipped in phenol or one of the mineral acids, and bored into the infected area.

Acne. Indurated and infected follicles can be aborted with the spark, and that without visible cicatrix. This is a really useful application of the method, and in the stage before that of active suppuration I like it better than incision and cupping. It is bloodless and practically instantaneous, and a large number of lesions can be treated at one session. Of course, the regular acne treatment must be carried out coincidentally.

Rhinophyma, or Hypertrophic Rosacea. MacKee claims excellent results. I have not employed it in this affection. He uses a moderate current giving a mild cauterization; an area the size of a quarter dollar is to be treated each time. The reaction is severe; there is abundant serous exudation followed by thick crusting; this separates in a week. Repeated applications to the same areas may be necessary.

¹ Journal of Cutaneous Diseases, June, 1909, p. 245.

² North American Journal of Homeopathy, April, 1909.

³ International Journal of Surgery, September, 1909.

⁴ Monatshefte für praktische Dermatologie, October 1, 1908.

⁵ Archiv für Dermatologie und Syphilis, November, 1908, p. 299.

⁶ Dermatologisches Centralblatt, March, 1909, p. 177.

Keloids and Scars. The results in these affections have not been especially satisfactory; as with excision and destruction by the cautery, a larger lesion is often the only result.

Lichen Planus and Chronic Eczema. Small indurated areas of these affections can be well treated by the spark if it is used vigorously. I prefer the solid carbon dioxide for the purpose, as in the affection next to be considered.

Xanthoma. These can be removed by the spark, although, in my experience, solid carbon dioxide is preferable.

Indolent Ulcer. A mild current, giving a gentle spark, is an excellent stimulant, and may be tried when other methods fail.

Tuberculosis of the Skin, Lupus Erythematosus. In the first of these affections the spark is advocated in conjunction with the X-ray; for the second, solid carbon dioxide. The author admits, however, and I entirely agree with him, that the last-mentioned treatment is the best. I rarely employ anything else.

Small Benign and Malignant Neoplasms; Nevi, Verruæ, etc. The spark may be employed here, but in most cases other methods are preferable. For the more superficial nevi, pigmentary or vascular, the solid carbon dioxide is better; the same holds good for rodent ulcer. For deeper-seated growths, the curette, the cautery, and chemical caustics have proved far better in my hands.

Malignant Small Growths. Here the high-tension spark is employed with great intensity; a careful technique is essential, the details of which cannot be gone into here. General anesthesia is usually required. The efficacy of the treatment in certain cases is admitted, but in cutaneous cancer it is neither more permanent nor more desirable than other methods. For fuller accounts the reader is referred to the numerous articles of De Keating-Hart and his followers.

My own conclusions as regards fulguration are as follows:

It is essentially a method of cauterization by means of the high-tension spark applied by a carbon or metal electrode. It possesses the advantage of being very manageable, so that exact applications may be made to minute areas, and exact dosage of effect is readily obtained. It is, however, extremely painful if anything more than a most superficial effect is desired. It will be found useful in some of the smaller and more superficial benign and malignant neoplasms, in various forms of nevus and verruca, and as a stimulant to indolent granulations. It is distinctly limited, however, in its efficiency, and is our only second choice in most affections. One great drawback to its use is the elaborate and expensive apparatus required for its employment.

Grain Itch. This name, employed by Schamberg,¹ is more convenient than that of Acrodermatitis urticoides; but we must not class the affection with the "dhobie" and other itches that have appeared from time to

¹ Journal of Cutaneous Diseases, February, 1910.

time, which are merely complicated or unusual cases of scabies, urticaria, etc. Grain itch is an affection of which the definite etiology and symptomatology have been thoroughly worked out by this author.

It was unrecognized in this country before 1901, when Schamberg published an account of it as a new and unfamiliar skin disease appearing in epidemic form. Since that time cases have been encountered in Philadelphia and its neighborhood, as well as in other localities in the United States, during the summer months.

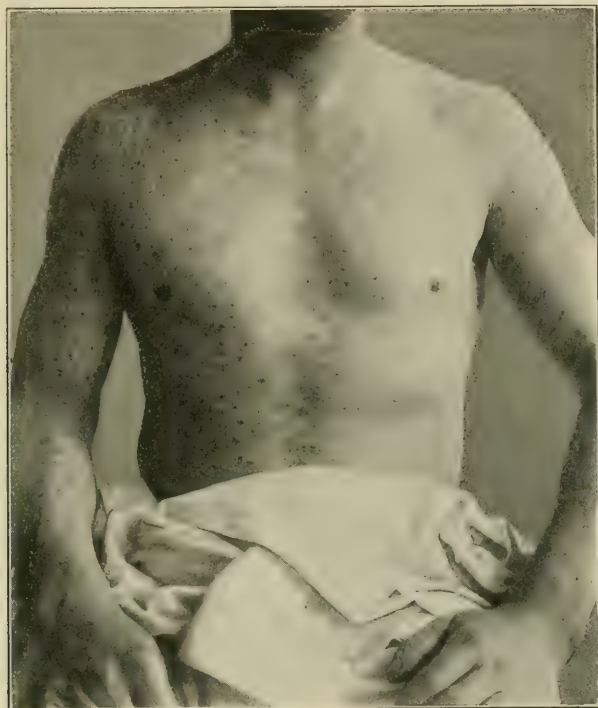


FIG. 21.—Grain itch. (Schamberg.)

Investigation shows that the same affection has been recorded many years ago in France, Germany, Russia, and other European countries. The eruption is urticarial in character, many of the wheals finally becoming capped with vesicles and later pustules. There is intense itching, often mild fever, and some general symptoms. There is usually a slight leukocytosis and a moderate eosinophilia, and sometimes albuminuria. I cannot but regard these latter symptoms as accidental in the cases in which they were found, since the cause of the disease has been proved to be a very minute mite, the *Pediculioides ventricosus*.

The parasite itself belongs to the class of *Acarina*, or mites, of a species so small as to be practically invisible to the naked eye. It does not burrow into the skin like the acarus of scabies. The symptoms which it occasions

are urticarial in character, although in many of the cases scratch lesions and infections caused a general picture which greatly resembled the scabies. In conjunction with Goldberger, Schamberg obtained the parasite, and induced lesions by the application to the skin of the material in which it was found. The organism is of some economic and agricultural importance, since the *Pediculioides ventricosus* is always found associated with and predatory on certain of the grain-destroying insects. It apparently destroys the larva of the wheat-straw worm, the joint worm, and the grain moth. All the cases occurred in persons who had slept on certain straw

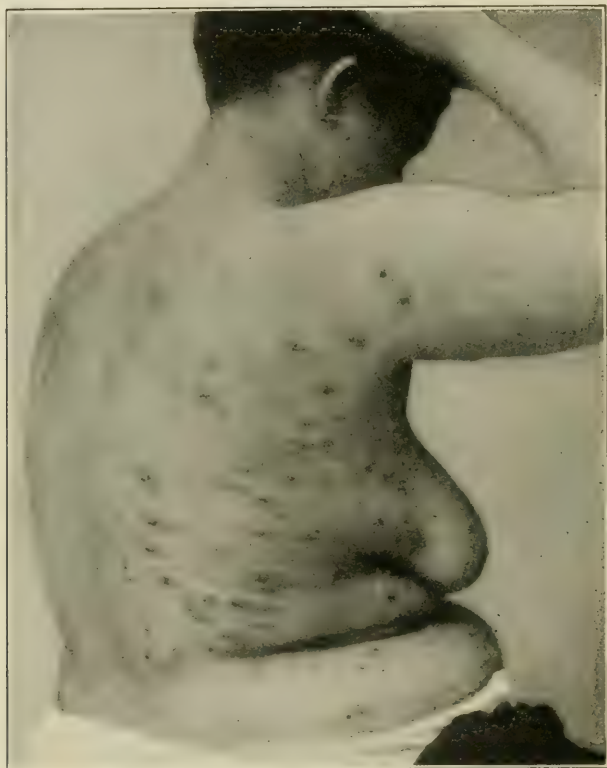


FIG. 22.—Grain itch. (Schamberg.)

mattresses, and when only one person in a household was affected, Schamberg and Goldberger were always able to ascertain that the patient had been the only one to sleep in a bed supplied with a new straw mattress. In fact, they were able to trace all the mattresses to four leading manufacturers, all of whom used wheat-straw, wholly or in part, obtained from a dealer in southern New Jersey. In fact, exposure of the bared integument to contact with the infected mattresses for a time promptly caused the appearance of the eruption. The proof as to the nature and causation of the malady was thus complete.

The *treatment* of the affection is simple when the cause is once recognized and removed, since the pediculioides is a surface parasite and does not enter the skin. Frequent warm baths and plenty of soap would doubtless suffice. Schamberg recommends the following ointment, which not only destroys the mites but also relieves the cutaneous symptoms:

R—Betanaphthol	gr. xxx
Sulphur præcip.	gr. xj
Adipis benzoïn.	ʒj

To prevent reinfection, the patient's clothing should be disinfected by boiling, or by careful sulphur or formaldehyde fumigation. Disinfection of the straw mattresses, which is recommended, seems useless; they should be burned. The itching usually subsides in from twelve to thirty-six hours, and the eruption disappears in a week or ten days. Without

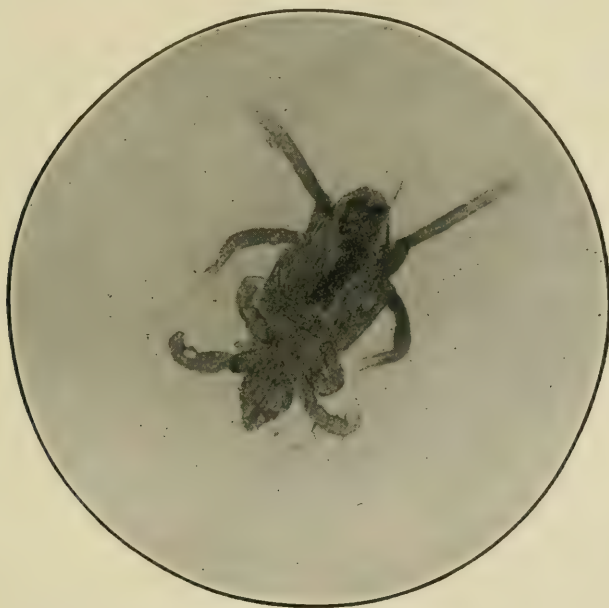


FIG. 23.—Parasite of grain itch. $\times 300$. (Schamberg.)

treatment the patient may suffer for weeks, but they finally recover spontaneously, so that it seems that the mite dies off after a time. It is important to recollect that not only the straw of mattresses but also that used for packing, or under carpets, or even contact with plants mulched with straw, may spread the affection.

External Lead Poisoning. This subject would seem at first sight to belong exclusively to the domain of internal medicine, yet I have experienced, and have recently recorded,¹ a case in which a generally recom-

¹ Journal of the American Medical Association, March 26, 1910.

mended and commonly employed lead lotion, caused fatal poisoning without any possible gastro-intestinal absorption. A brief abstract of the case may serve as a warning:

A few years ago a patient suffering from a third rail burn of the face, neck, upper chest, hands, and arms was admitted to my service in the hospital. His face was but slightly scorched; his neck and chest were more severely burned; while on the hands and arms there were necrotic areas which had exposed some of the tendons. When admitted the injury was a month old; the patient's general condition was good; there was no fever; the internal organs and functions were normal; and extrusion of necrotic tissue and granulation were progressing normally. The local treatment consisted of applications of Burow's solution, 1 to 8 of water; no special general treatment was needed. The local lesions did well; the exposed tendons began to cover up, the sloughs disappeared, and a line of demarcation began at the third phalanges of the most badly burned index and middle fingers and thumb of one hand.

After a week or two, however, the man's general condition became unsatisfactory. Obstinate constipation set in, relieved with difficulty by purgatives. In the fourth week he began to complain greatly of pain in his stomach; there was a point of epigastric tenderness; he vomited stomach contents once or twice; his tongue was coated, and his breath was foul. The internist who examined him suspected the presence of a gastric ulceration, but could find nothing positive. By the fifth week emaciation was marked; tremor and wrist drop set in; and a faint blue line on the gums settled the diagnosis of lead poisoning.

The dressing was immediately changed, and all possible measures were adopted to combat the advancing plumbic intoxication. It continued to advance, however, in spite of all we could do; the weakness increased, delirium appeared, the tremors became more marked, ecchymoses appeared on the skin, and the patient died at the beginning of the eighth week.

There can be no question that the lead absorption occurred through the granulating wound surfaces. No dressings were placed around the mouth, as the lips were not burned; the patient was fed, as his hands were completely covered with dressings and rubber tissue, so that introduction of the drug through the alimentary canal did not occur. Besides this, the intensity and severity of the intoxication precluded the possibility of its being occasioned by the frequent introduction of small amounts of the metal through the mouth.

Examination of the ward solution employed, inquiry into the methods practised in other institutions, and the recommendations of authorities revealed a remarkable state of affairs. Lead salts, in solution or suspension, are recommended as an external application in many dermatoses, the metal being supposed to be non-absorbable, at all events where the epidermis is intact. According to some authors, it is hardly possible to

force lead through the skin; Lewin¹ found that the most vigorous use of a lead acetate spray did not result in absorption, although he found some evidences of absorption when the integument was inflamed, or the cornuous layer destroyed. Lead salts in solution or ointment are recommended by all authorities from Cazenave and Schedel in 1862, to Andry, Durand and Nicholas in 1909, for the most varied dermatoses, including inflammations and infections, without mention of any danger of absorption. Crocker² uses subacetate of lead lotions in excoriations. Paschkis³ recommends lead water for all manner of ulcerations, saying that when the epidermis has been destroyed the lead in combination with the exudation forms a protecting cover to the lesion. More than this, lead applications are specifically advised in burns by many of the surgical and dermatological authorities; Gross and Wyeth⁴ use ordinary white lead paint; Wood⁵ advises carbonate of lead in linseed oil, or as an ointment; Veiel⁶ and Bumm⁷ use lead lotions; von Notthaft⁸ and Thiemenn⁹ use lead-water; Witherstine,¹⁰ Ringer and Wood¹¹ recommend the treatment without mentioning any dangers of absorption. It is evident, therefore, that solutions frankly containing lead in soluble or insoluble form are regularly employed in the treatment of ulcerations and burns.

Burows' solution, liquor alumini acetici of the German Pharmacopœia, is extensively used in the treatment of burns, especially abroad. It may or may not contain lead, in accordance with its mode of preparation, being either a clear solution of aluminum acetate, or a turbid fluid containing an abundant precipitate of sulphate of lead. The latest German Pharmacopœia¹² does not use lead acetate in its preparations, but the older formula, and that still in common use, is as follows: 95 parts of potassic alum are dissolved in 700 parts of distilled water, to which is added, when cooled, 151 parts of "raw" lead acetate. This is filtered. 100 parts of the clear fluid contain 5 parts of aluminum acetate, with a little potassium acetate. No lead is in the filtrate.

Many authorities, however, omit the filtration, and even imply or expressly direct that the sediment be used. I need mention only two: Von Notthaft's¹³ directions are: To be well shaken before using; Lang¹⁴

¹ Ueber das Resorptionsvermögen der Haut, insbesondere für Bleiverbindungen, Deutsch. med. Ztschr. 1883.

² Diseases of the Skin, 1893.

³ Encyklopedie der Haut und Geschlechts Krankheiten, Lesser, p. 18.

⁴ Manual of the Practice of Surgery, Bryant, 1881, p. 129.

⁵ Text-book on Surgery, 1881, p. 91.

⁶ Handbuch der Hautkrankheiten, Ziemssen, 1883, p. 345.

⁷ Therapeutisches Lexicon, 1891, p. 1665.

⁸ Taschenbuch, 1903, p. 77.

⁹ Therapie der Haut under Geschlechts Krankheiten, 1901, p. 155.

¹⁰ Annual Cyclopedia of Practical Medicine, Sajous, 1899, p. 367.

¹¹ Handbook of Therapeutics, 1880, p. 234.

¹² Hager, Handbuch der Pharmaceutischen Praxis, 1903.

¹³ Taschenbuch, 1903, pp. 137, 168.

¹⁴ Therap. für venerische und Hautkranke, 1889, p. 108.

expressly prefers von Notthaft's formula, using the freshly prepared solution as a wet dressing. Luithlen¹ rejects the new filtration methods for the preparation of Burows' solution, and states explicitly that "the preparation is best used unfiltered, being well shaken before it is employed."

Inquiry into the practice in various medical institutions in New York City revealed a similar difference. In some of them, Burows' solution is always decanted or filtered, or both, before being used; in others, including some of the largest, the sediment is carefully preserved as part of the lotion. In my cases, I found that the unfiltered solution had been used.

It seems very probable that idiosyncrasy, or rather an especial susceptibility to metallic poisoning of this variety, played a part in the case under consideration, for, in spite of the extensive employment of lead in various forms as an external application, severe plumbism from this source is rare. I have been able to find but two similar cases. O'Carroll² reports a fatal case from the use of hair dye containing lead. Pässler³ saw the use of diachylon ointment in an eczematous infant cause a violent attack of lead poisoning, with a hemorrhagic nephritis, but ending in recovery.

It is needless to say that since this accident occurred, several years ago, I no longer use Burows' solution, filtered or unfiltered, for burns or any extensive inflammatory affection of the skin. Equally good results are obtained from a harmless boric acid wet dressing. In fact, I do not advocate the external use of lead in any case where it can be avoided.

Leprosy and the Leprosy Congress. The first International Leprosy Congress was held at Berlin in 1897; the second took place at Bergen in August of last year. The location was a good one, since it was at Bergen that some of the earliest and best work on the disease was accomplished, and it was there that Hansen, the President of the Congress, discovered the specific bacillus. The conclusions of the Congress are important in view of the very prevalent lack of knowledge concerning the disease even in medical circles, not to speak of the absurd leprophobia of the public. They epitomize the experience of the best leprologists in the world, and while there were no notable additions made to our knowledge in any important phase of the disease, there are certain points in the papers and discussions that are of general interest, and therefore worthy of note. I shall discuss them in connection with the other work on the disease that has been done during the year.

1. **ETIOLOGY AND METHODS OF TRANSMISSION.** Ehlers discussed the possibility of *transmission of the disease by blood-sucking insects*, as first suggested by Goodhue, in 1904, who claimed to have found the bacilli in the bed-bug and the gnat. His conclusions were against the probability of this mode of transmission, since leprous blood contains them only in very small numbers; nevertheless, it might be possible if there should

¹ Therapie der Hautkrankheiten, 1902, p. 16.

² Dublin Journal Med. Sc., January, 1904.

³ München. med. Wehnschr, 1894, p. 389.

happen to have been a large crop of new lesions containing large numbers of the microbes just before death. As the usual mode of infection, it must be rejected. *Heredity* was considered by von Düring, but here also the conclusions were essentially negative. There was no evidence of intra-uterine infection; no children were born leprosy, but the children of leper parents seemed to show a predisposition to the infection as they did to tuberculosis, and were subject to a very high mortality rate. Hutchinson advocated the transmission of the disease by fish eating; he stood practically alone, however, there being absolutely no evidence in support of the correctness of this theory.

2. TREATMENT. Interest largely centred upon *nastin*, which has been claimed to give results by a number of observers, including Deycke and Reschad,¹ Kupfer² and others. There is some confusion as to the nature of this therapeutic agent. It was at first supposed to be a fat obtained from the lepra bacilli themselves, and to produce lepra antibodies in the organism treated. It was later announced that this was not the case, and that it was gotten from the culture of a streptothrix in no way related to the specific bacillus. At the Congress, Deycke stated that it is a neutral fat obtained by making an ethereal extract of a streptothrix which he had cultivated from some leprosy cases in Constantinople. This was not the leper bacillus, but, in Deycke's opinion, closely related to it. Mixed with benzoyl-chloride it is what is designated *nastin B*; it is used by injection and is supposed to cause bacteriolysis of the lepra bacilli by removing their fat. In the general discussion, the consensus of opinion as to its usefulness was adverse to it; and this has been the conclusion of other writers, among them Lesser.³ My own experience with it has been limited to two cases, one of the maculo-anesthetic variety and the other of the tubercular variety. In the first case, its long-continued use was accompanied by a marked improvement in the pigmentation, although the paresthesia was uninfluenced; in the second case the patient passed through an acute pulmonary infection while under treatment, and, as is usually the case under such circumstances, there was a retrocession of the tubercles when he recovered. My own opinion, therefore, is that although I see no reason to be enthusiastic about *nastin*, it deserves further trial in the absence of any other efficient remedy.

Among the other remedies advocated during the past year I may mention Hollmann, who, from his experience at Molokai, urges the use of *eucalyptus* both internally and by means of baths. He has employed it largely for two years, with the results that the glandular elements of the skin appeared to be stimulated, the integument got softer and more pliable, the facies leonina became less marked, the neuritic pains were much improved, the abscesses of the skin and mucosæ healed, and the fever

¹ Deutsche medizinische Wochenschrift, 1907, No. 3, p. 89.

² Monatshefte für praktische Dermatologie, May 1, 1909, p. 419.

³ Ibid., p. 418.

decreased. Two hundred and seventy-five patients were treated during the two years; all were helped, and all had had leprosy for from five to twenty years. The death rate in the settlement during the time was only 5 per cent.; and but 2 per cent. of this was directly due to lepra. Hollmann cannot reaffirm the statement that he has previously made, that nodules disappear under the treatment; but he believes that incipient cases may be cured.

Hirschberg¹ has turned to the *x-ray* again for the amelioration of the local lesions of leprosy, and claims to have caused tubercles to disappear in this way. Engel Bey,² at the Congress, stated that he had gotten good results from the use of *anti-leprolin*, a chaulmoogra oil preparation for hypodermic injection. Finally, Morris and Nichols³ have tried to elaborate a *vaccine treatment*. A small nodule was excised from the patient, cultured for fourteen days in the oven in glycerin bouillon, dried, and a bacillary emulsion of determined concentration made. They claim very great improvement from its use.

3. PROPHYLAXIS. On this very important point the official conclusions of the Congress, given below, represent the opinions of observers in regions where leprosy is more or less endemic, rather than those of investigators in general. They are notably less radical, however, than those formerly advocated, especially in regard to segregation, which they merely called "desirable." They do not in any way cause me to modify the opinions which I have previously expressed, that leprosy, under the conditions here prevalent at least, is so slightly contagious that attempted forcible segregation is cruel and useless; that voluntary institutional treatment of advanced and pauper cases is desirable, but not a necessity; that cases can be kept for indefinite periods in general institutions together with other patients, certain elementary precautions being observed where there are open and secreting lesions; that the popular fear of association with and ordinary contact with cases of the disease is utterly without foundation; and that cases that are so circumstanced as to be able to take care of themselves need not be interfered with, and can be left to the care of their physicians. The conclusions of the Congress epitomized are as follows:

1. Leprosy is contagious from person to person, though the mode of transmission is unknown; every country may therefore take protective measures.

2. In view of the success attained in Norway, Iceland, etc., segregation of lepers is desirable; they should be placed under such conditions as are voluntarily acceptable to them.

3. It is not desirable that lepers should practise certain trades that bring them into close contact with healthy persons.

¹ St. Petersburg medicinische Wochenschrift, 1909, Nos. 5 and 7.

² Monatshefte für praktische Dermatologie, October 1, 1909.

³ Ibid., March 15, 1909, p. 265.

4. It is desirable that the healthy children of lepers should be separated from their parents as soon as possible, and remain under observation.

5. An examination of those who have lived with lepers should be made from time to time by a competent physician.

6. The questions of the transmissibility by insects and the possibility of the existence of the disease in animals (rats) should be studied.

7. The disease is probably not incurable; but we have as yet no remedy for it, and the search for a specific should be continued.

The Geographical Distribution of Leprosy. Reports from various parts of the world upon this subject were made at the Bergen Congress last year, and were naturally received with great interest. It was important, if possible, to form some idea as to whether it is on the increase or the contrary; though the entire absence of anything like statistics in the countries where it is apparently most prevalent makes it difficult to judge. It is only during the last few decenniums, indeed, that the disease has been recognized and studied in civilized countries. Medieval Europe was full of leper houses, although how much of syphilis and other affections was included in the designation is still undetermined; and then about the time that the luetic infection ravaged the civilized world in the middle ages, leprosy sank out of sight and was forgotten. Not that it ever ceased to exist; foci of it remained all over the globe; but it is only quite recently that its recognition has become general even in medical circles. In a disease of such slow and insidious onset, cases may go on for many years unrecognized by both patient and physician. The incentives to concealment are great, and in many cases it can easily be effected; and since, as I have elsewhere shown, the leper usually dies of some other disease, neither our mortality nor our morbidity statistics are any measure of its prevalence. Hence, the more and more complete reports that are made at every congress and in the files of the special journals may well be evidences of increased facility of recognition of rather than proofs of its increase. At a recent meeting of the East Side Physicians' Association in New York six cases of leprosy were shown, several of which presented such slight though positive evidences of the disease that they would undoubtedly be passed over or misinterpreted by an unskilled observer. Dr. Howard Fox informs me that he personally knew of 22 cases living in New York City in the winter of 1909, and though we have no means at hand to form an exact estimate, I should judge that 100 is a low figure for the number of cases that must be here.

In most of the leper colonies the number of inmates is diminishing markedly; especially is this the case in Norway and in the Sandwich Islands. As to the number of cases in general, the reports were fragmentary and incomplete. For Germany, Kirchner reported only isolated cases, possibly 100 in all; in the Cameroons there were many hundreds, though but few in the other German-African colonies, Samoa, and the Islands. In France, Jeanselm stated that there were very few; but there

were many in Senegal, Reunion, and New Caledonia; in Madagascar, 8480; in Cochin China, about 15,000; von Peterson, for Russia, gave no figures, but there must be many cases, since he mentions 137 as coming from the Petersburg Province alone; Dehio stated that there were 937 cases in Livonia. Kobler places the number of lepers in Bosnia at 393. Raynaud reports 109 cases in Algiers. Babes, for Roumania, reported 328. Bordoni-Uffreduzzi estimated the number in Italy at about 200. Wise and Curry placed the number in the United States at 150, which, I think, is an underestimate. Kitasato brought the exact figures of 23,815 lepers for Japan. Finally, Sommer, for Argentina, reported 730.

Of course, even these imperfect figures account for perhaps only about one-third of the inhabitants of the earth; many of the largest and most populous countries, where leprosy is known to be very prevalent, like India, China, South America, etc., are left out altogether. But even the figures stated, however, mount up to 50,000; and it seems as if there must be several hundred thousand lepers in the world.

The Treatment of Lupus Vulgaris. It is now a number of years since this subject was last considered in this review.¹ The recent appearance of a general article upon this subject by one of the oldest and most experienced of our teachers of dermatology offers a favorable opportunity to repair the omission. Before discussing his conclusions, a word may be said of the methods advocated for many years by Lang, and recently reiterated:² *Excision* has been his general practice; he has performed it in 412 cases since 1892; his last series includes 291 patients, of whom he reports 262 cured six months after operation. For small lupoid foci this is undoubtedly a desirable procedure, especially when they are so situated that excision can be effected without undesirable mutilation; but it is just lesions of this character that are readily amenable to treatment with carbolic acid, the actual cautery, or other caustics. For other cases, situated as the lesions usually are, upon the face, excision, with the subsequent flap transplantation, skin grafting, etc., which is often necessary, I cannot but regard as the last resort, and not the treatment of election. The method suggested by Payr³ may also be mentioned here. He makes two parallel incisions in the skin, one on each side of the affected area, dissects loose the skin between, and is thus enabled to apply the medication to both the upper and the lower surface of the affected area. Strips of gauze, soaked in Balsam of Peru, or impregnated with any desired medication in a thin ointment or oily menstruum, are passed under the bridge of affected skin, and a similar application made to the outside. I have never employed this method and so cannot criticize it, but it hardly seems one which will obtain wide acceptance.

Doutrelepont is the authority above referred to, who summarizes the

¹ PROGRESSIVE MEDICINE, September, 1905, p. 114.

² Deutsche medizinische Wochenschrift, October 7, 1909.

³ Monthly Cyclopedia of Medicine and Surgery, December, 1909, p. 731.

results of his experience of fifty years in the treatment of the disease.¹ He finds that the chief surgical procedures—the actual cautery, galvano-cautery, curetting, punctate cauterization, and scarification—rarely give permanently satisfactory results. He employs them only in exceptional cases. They are not entirely free from danger on account of the possibility of disseminating the tubercle bacilli through the opened blood and lymph channels, as in a case which he reported years ago, in which a tuberculous meningitis followed the curettement of a lupus of the cheek. Personally, I think this danger so remote as to be entirely negligible, and I believe these cauterization methods to be entirely proper in suitable cases.

Doutrelepont advocates excision only in cases where the conditions are such that complete closure of the wound is possible. The incisions must be made wide of the affected area in healthy tissue. Ethyl chloride or general anesthesia must be employed, since, in Doutrelepont's opinion, local infiltration anesthesia exposes the patient to the dangers of local or general dissemination of the microorganisms. He rejects large excisions, with transplantations or grafting, the cosmetic results are not comparable to those obtainable by other means, and local relapses and hematogenous infections occur. In general, I agree with him in these conclusions.

The *tuberculin treatment* Doutrelepont regards as of real advantage in the treatment of the disease, more especially since Koch's new tuberculin (T R) has been introduced. He has used it extensively; cautious dosage in the beginning ($\frac{1}{2}$ to 1 mg.) has enabled him to avoid the undesirable effects recorded by some authors, and many patients derive undoubted benefits from its employment. He employs it in conjunction with other measures in all cases of lupus. He does full justice, also, to the good results attained with the Finsen treatment and the x-ray, both of which he employs in suitable cases.

It is a fact, however, and one which all of us recognize who have occasion to handle these cases in the larger field of public practice, that all three methods—tuberculin, actinotherapy, and radiotherapy—are too tedious and too expensive for the mass of lupus cases, occurring as they do among the poorer classes. Success can be obtained with them, but relapses do occur. It is difficult to persuade patients, even if they have the time and means, to repeatedly undergo a treatment that has given only partially satisfactory results. Doutrelepont has, therefore, of late years turned his attention to less costly and troublesome procedures. These include the use of 1 to 1000 sublimate compresses, pyrogallol in 10 per cent. ointment, caustic potash, thiosinamin or fibrolysin injections. The regular course of procedure in his clinic at Bonn is as follows:

Every case of lupus, no matter where situated, is at first treated with

¹ Archiv für Dermatologie, February, 1910, p. 191.

the sublimate compresses. In the exceptional cases in which there is any doubt as to the diagnosis, an injection of old tuberculin ($\frac{1}{5}$ mg.) is given to settle the question. When that is decided, and when there are no contraindications, either in the lungs or the system at large, treatment with T R is instituted, beginning with $\frac{1}{500}$ mg. every second day, and increasing by the same amount at each injection. The temperature after the injections is, of course, closely watched. A dosage of 2 mg. is rarely exceeded; the large doses advised in some quarters (up to 20 mg.) have but rarely been employed, and when they have been they did not effect immunity; relapses occurred as frequently in these cases as in those in which less heroic dosage was administered. It goes without saying that all possible hygienic measures—diet, fresh air, etc.—are coincidentally insisted upon.

Further local measures vary with the case. Where the tuberculous granulations of lupus hypertrophicus are present they are curetted off with a sharp instrument and with as little violence as possible, and the wound then superficially cauterized with the Paquelin cautery. This last procedure closes up the open blood and lymph channels, and prevents local or distant metastasis. After the resultant eschars have fallen under the sublimate compress, the 10 per cent. pyrogallol ointment is applied for three or four days. Then the resulting eschar is allowed to come away under the sublimate compress, and the pyrogallol reapplied in the same way. This process is repeated until healthy granulations spring up in the wound, which is then allowed to heal under the antiseptic dressing. Sometimes this dressing is very painful immediately after the pyrogallol application, if so, the concentration of the sublimate must be lessened, or an attempt must be made to combat its effects by powdering orthoform anesthesin, etc., on the wounded surface before applying it. Non-hypertrophic lupus foci are treated at once with the pyrogallol without antecedent operative procedure.

The *x-ray* is employed during the sublimate-pyrogallol treatment when possible, but its employment is kept within narrow limits as to intensity of application, in order to avoid any visible reaction and especially to prevent the appearance of the deforming atrophies and telangiectasies. If they do occur, solid carbon dioxide is used to destroy the vessels.

After complete cicatrization has set in, the *Finsen ray* is used in suitable and not too extensive cases to prevent relapses, and to destroy any foci which may remain. For the same purpose, the galvanocautery point may be employed, but the author prefers the pointed nitrate of silver stick. Very minute and superficial foci can be cured by the tuberculin inoculation according to the method of Pirquet. When the patient is apparently entirely cured, injections of old tuberculin are instituted to prevent a relapse, beginning with 1 mg. and going up to 10 or 20 mg. if no general reaction occurs. Doutrelepon is entirely convinced that this final course of treatment is of great importance, leading to the disappearance of minute

foci entirely indistinguishable in the scar tissue. Finally, the patient is to be dismissed with the warning that relapses occur even after the longest and most careful treatment, and that he must be seen at the very first sign of a return of the disease.

There is reason for some difference of opinion with regard to the efficacy of some of the measures that Doutrelepon recommends, but, in a general way, the rationality of his plan cannot be denied. Its essence is the importance of not relying upon any one method in handling the affection; neither excision, nor radiotherapy, actinotherapy, or caustics fit every case. In addition, it gives us a useful basis to work upon. With the hygienic general treatment as a groundwork, pyrogallol, of undoubted efficacy in many cases, is to be applied in courses alternating with antiseptic dressings. The knife, the sharp curette, the cautery, carbolic acid, the silver stick, etc., are to be used when indicated. The *x*-ray and the Finsen treatment, when practicable, are used as adjuvants, and to prevent relapses. Thiosinamine and fibrolysin are employed to minimize the deformity resulting from treatment. I see no objection to the use of tuberculin throughout the treatment in the cautious way advised, although I cannot say that I have noted any very great results from its use myself. In any case, the conclusions reached are of importance as embodying the results of a lifetime of experience in the treatment of a very serious and very obstinate affection.

Pellagra. This affection has excited a good deal of interest recently, more especially in the South, and since some of the commonest and most obvious changes that it occasions are in the skin, it deserves consideration here. Pollock¹ reports the histories of 14 cases observed in the Cook County Institutions at Dunning, Ill. His researches show that the disease has existed for many years in the Carolinas, Georgia, Alabama, etc., though it has only recently been recognized as a disease entity. In the Northern States, sporadic cases have been observed. In Europe, especially in Spain and Italy, it has been known since the middle of the eighteenth century, although it was well into the nineteenth before its connection with the ingestion of diseased corn was proved by Balardini and Lombroso. In parts of Southern Europe and Northern Africa it is very prevalent, it being estimated that there are 30,000 cases in Roumania and 100,000 in Italy. Lavinder² reported to the Surgeon-General as a conservative estimate some 1500 cases in the Southern States.

In Italy, where the disease has been most extensively studied and whence we have its name, pellagra is considered to be an intoxication caused by toxins produced by fungi of spoiled maize, although alcoholism, bad hygienic surroundings, venereal excess, etc., are supposed to have at least a predisposing influence upon its occurrence. The pathogenesis of the disease is still unsettled, but, as Pollock remarks, corn may bear

¹ Journal of the American Medical Association, October 2, 1909.

² Public Health Reports, June, 1909, xxiv, No. 25.

the same relation to pellagra that swamps do to malaria and yellow fever. The pathological changes are those incident to various cachexiæ; wasting of the fat and muscle, atrophies, and fatty degenerations of the internal organs, pigmentary deposits in various tissues, especially the nerve structures and the skin, etc.

The dermal changes are characteristic, and are frequently the chief object of complaint for which medical advice is sought. They begin as a symmetrical erythema, more especially of the exposed parts of the skin, the backs of the hands, the forearms, and the face and neck. The redness and puffiness slowly becomes more marked; the color finally becomes



FIG. 24.—Pellagra. (Pollock.)

purplish; and the affected areas are sharply demarked from the healthy skin. Dryness, scaling, cracks, fissures, and even bullæ appear, until at last the entire affected areas of integument are blackish purple and atrophied. Appended are two characteristic pictures of the skin changes.

The mental and nervous symptoms are varied, including vertigo, neuralgia, paralysis, tremors, and psychic manifestations, usually melancholic, but sometimes taking the form of maniacal attacks. The affection is very chronic, lasting many years, but acute cases have been recorded. The differential diagnosis is said to be between pellagra and the various grain and food poisonings, lichen, scurvy, leprosy, and beriberi. I have

not as yet seen any cases here, but from the descriptions and figures of the dermal lesions the chief affection with which it is liable to be confounded is atrophica cutis propria or idiopathic skin atrophy. The physical characters of the skin lesions are the same, but the presence of general symptoms, and especially the evidences of involvement of the nervous system, should make the differentiation easy. Idiopathic atrophy of the skin is a purely local dermatosis.

The prognosis of pellagra is serious, and the mortality is high, at all events in the United States. Treatment has not been effective. Removal of corn from the diet, arsenic, quinine, strychnine, and atoxyl have been employed, but with little result.

Among the other authors who have recently reported cases of the disease in the United States I may mention Drewy,¹ who has made a clinical study and report of 14 cases in Virginia; King,² who records 12 in an institution of charity housing 49 children in Tennessee; Hewitt,³ who reports and figures a case in Virginia; and Wood,⁴ who has studied the

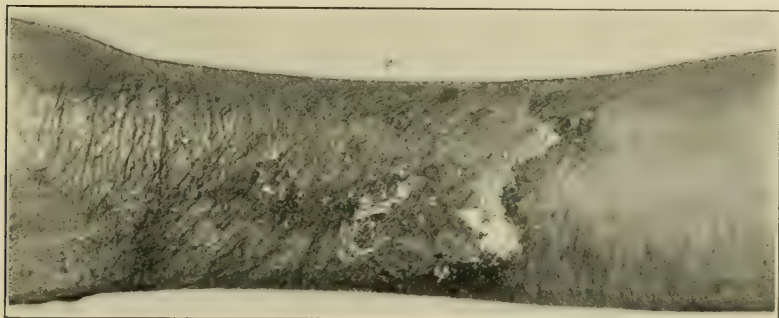


FIG. 25.—Skin lesion in pellagra. (Hewitt.)

symptomatology and etiology of the affection very thoroughly, and who gives a very complete bibliography of the subject. In view of the prime importance of corn as an article of diet, especially in certain sections of our country, and the further facts that increased familiarity with pellagra seem to show that it is much more prevalent than was supposed, the subject is evidently one of great importance.

Pregnancy Eruptions. I feel very sure that the toxemia of pregnancy, like that from other sources, sometimes occasions skin eruptions; yet the records of such occurrences are extremely rare. When the case below mentioned was presented before the Section of Obstetrics and Gynecology of the New York Academy of Medicine this winter, several members stated that they had seen dermatoses of various kinds coincident with and

¹ Virginia Medical Semi-Monthly, September 24 and October 22, 1909.

² Southern Medical Journal, November, 1908.

³ Journal of the American Medical Association, October 2, 1909, p. 1085.

⁴ Ibid., July 24, 1909, p. 274.

evidently connected with the pregnant state, but without any very definite study or diagnosis being made. Ward¹ has recently recorded a case under the designation of *hydroa gestationis* very similar to my own. He uses the term *Hydroa* in the English sense as meaning almost any vesicular or bullous eruption; and the history of the case shows that it was one of bullous erythema multiforme. The patient, aged twenty-eight years, was pregnant for the eighth time, and was suffering from her eighth attack of the skin affection. It had always appeared at from the fourth to the seventh month of gravidity, and once she had had a relapse during the puerperium. It always began as a giant urticaria, developing into a picture like that of a dermatitis herpetiformis, and finally assuming a pemphigoid character.

My own case had been four times pregnant, and had had the eruption each time. Three of these attacks I had the good fortune to observe myself and to photograph; the fourth one both the patient and her physician described to me as precisely similar to the other ones. Her first attack occurred in September, 1901; she was then twenty-five years old, had been married one year, and was five months pregnant. It began as a papular urticaria, which soon developed under the scratching and general irritation of the skin into a general eczema. By December it had become a typical erythema multiforme of the papulovesicular type, the iris lesions on the anterior surfaces of the forearms being especially well marked. The eruption disappeared in January, immediately postpartum. The baby died at the age of six weeks of unknown cause, but it had a skin eruption which both the mother and her doctor said was precisely similar to hers.

Her second attack, when pregnant again in 1902, I did not see. The history shows, however, that it was precisely similar to the eruption of the first pregnancy, but milder; it got better in four weeks under local treatment. She was much better in health during this pregnancy than in the first one. The baby of that gestation was well, and is living yet, but she had a short-lived bullous eruption immediately after delivery. Evidently the toxemia was much less pronounced.

She became pregnant for the next time early in 1905. In the tenth week occurred a general bullous eruption, which became so bad that she had to go to a hospital. In spite of this the confinement was uneventful, and the baby was well, but the general bullous eruption persisted, and four weeks postpartum, at the end of October, I took her into my service at Lebanon Hospital (Fig. 26). There was a general bullous eruption, most marked upon the legs. Large and small blebs, excoriated surfaces, crusts, and scratch marks covered the skin, and all the unaffected areas were deeply stained from previous lesions. She improved rapidly under a boric acid wet dressing, and was discharged cured in a month.

¹ *Lancet*, June 21, 1909, p. 1827.

In December, 1909, I found her again in the hospital. She had not been pregnant in four years, and her skin had been clean. Three weeks after becoming pregnant last August a general erythematous and eczematous eruption began again. She aborted on October 17, but the eruption persisted, and late in that month bullæ began to appear. She had,



FIG. 26.—Erythema multiforme gestationis. (Gottheil's case.)

when I saw her two months after miscarriage, the same vesiculobullous and iris eruption that she had suffered from before. She got well in about six weeks (Fig. 27).

Erythema multiforme under ordinary circumstances is apparently due to an infection of unknown origin. Its dependence in this case upon the toxemia of pregnancy cannot be doubted.

Quinine in Dermatoses. Quinine in massive doses has been recommended in a number of papers as a remedy for some of the more obstinate

of the general inflammatory dermatoses, such as generalized eczema, dermatitis exfoliativa, pityriasis rubra, etc. I have employed it in one very bad case of each of these affections, and with satisfactory results. Local treatment was of course continued in each case, but the satisfactory result attainable in many cases from this alone is well known. A notable feature in each instance was the tolerance to the drug that was soon established. The case of pityriasis rubra was far advanced, the patient was bedridden,



FIG. 27.—Erythema multiforme gestationis. (Gottheil's case.)

greatly emaciated, and had cardiac and renal lesions. He was in Lebanon Hospital, and under close observation, and was given the drug quite cautiously at first; he stood it well, and was soon taking 40 grains daily. The eruption faded markedly, and the pruritus diminished, but at the end of three weeks he developed gastric intolerance, and the medication had to be stopped. The generalized eczema case was also in the hospital, he had been treated for several weeks without any marked success; the dermatitis would improve a little and then get worse again, as

occurs usually in these cases. The dosage in his case was pushed to 60 grains daily; there was no intolerance, and there were no symptoms from the drug save moderate tinnitus and deafness. He recovered completely under quinine and the same local treatment that he had been getting before.

The third case was a private patient who had been long under the care of various dermatologists for a bad exfoliative dermatitis. His general health was good, although his rest was much disturbed by the incessant itching. The most varied external applications had been employed without relief. Quinine in small doses troubled him, causing dizziness and tinnitus, but this ceased as soon as he got over 15 grain doses. He took the drug steadily for eight weeks, finally getting 75 grains daily. Slight deafness, with occasional transient attacks of buzzing, were its only deleterious effects. The eruption rapidly improved; the redness faded; the scaling diminished; the patient rested well as the pruritus disappeared, and he was able to go to business again. The local treatment during the whole of this period was the same—3 per cent. salicylic acid oil, to which a little oil of birch tar was added later.

Ringworm Treatment and Ringworm Schools. The unsatisfactory nature of the ambulant treatment of ringworm of the scalp, as ordinarily carried out in public practice, must be generally admitted. As a rule we are not able to follow up these cases very long; they improve under the methods usually employed, and then they disappear, to turn up later at some other medical charity. I am quite ready to confess that the cases which I have been able to follow up have but rarely been marked "discharged cured" when their histories were ended, and I suspect that not all even of these have been really and definitely healed. In private practice the conditions are different. An amount of attention can be given to individual cases that is entirely out of the question for public patients, but even in them the curative process is long and halting, marked with many relapses, and often ineffective.

Some years ago I recorded in these pages¹ my own unsatisfactory experiences in a very large institutional epidemic of the disease, and I considered at some length the radiotherapeutic procedures that were then, for the first time, being extensively employed, especially by Saboureaud in the Ringworm School at Paris. The four years that have passed since then have given us time enough to form definite conclusions on the subject.

Saboureaud himself has had more experience with the method than anyone else, some 500 on the average being treated yearly in the Paris School. His latest conclusions are contained in a recent article,² in which he also discusses some objections, largely theoretical, that have been urged against it. He has never seen anything suggestive of injury to the brain. At first he did not use the method until the children were over two years

¹ PROGRESSIVE MEDICINE, September, 1906, p. 126.

² Annales de Dermatologie et de Syphilographie, July, 1909.

old and the fontanelles were closed, but now he uses the rays at any age. After having treated over 2000 patients for ringworm of the scalp by this method, he has never seen any nervous symptoms, not even headache or a modification of the pulse, from it. Of course, the danger of a radio-dermatitis is always present, which may lead to very troublesome ulceration and permanent baldness. To measure the strength and duration of the exposures, he uses a special pastille of the platinocyanide of barium, mixed with any acetate collodion. The treatment is done in semidarkness, since sunlight affects the color of the pastille and interferes with its reliability as an index of exposure. All parts of the scalp, save the area to be treated, are of course protected from the rays by "localizing" tubes. An interesting observation is the fact that previous medication of the scalp renders it more susceptible to inflammation from the ray, which must therefore be employed with much more caution under these circumstances. My own experience, in exactly the reverse direction, runs parallel with this. Tissues that have been rayed are bad ones for any other chemical or mechanical interference. I have noticed this especially when using the curette or caustics for malignant cutaneous degenerations that have been previously subjected to radiotherapy.

Adamson¹ also advocates the *x*-ray treatment, advising, however, that the tube be directed not toward the centre of the head, but obliquely, so that part of the cone of rays strikes the protecting shield, and thus the dangers of overlapping of areas and overtreatment of portions of the scalp be avoided. He calls attention to facts that are useful to remember, namely, that the quantity of rays received at any exposed point varies inversely as the square of the distance from the source, and directly as the size of the angle of their incidence. MacLeod, in the same journal, comes to the following conclusions:

1. That the *x*-ray treatment of ringworm by the single dosage method, regulated by the pastille, is practically safe and harmless.

2. Accidents of overexposure, even in experienced hands, may happen; but they are so rare that they should not discredit a method of treatment possessing such obvious advantages.

3. Severe dermatitis followed by permanent baldness is due either to overexposure, or by exposing an area whose resistance has been lowered by the previous use of strong irritants, or by overlapping of exposed areas.

4. Permanent baldness or delayed hair growth without dermatitis may occur in rare instances from personal idiosyncrasy.

5. He has seen no evidence of injury to the brain from the treatment; there are none recorded in the literature; and the experiments he has made in this direction strongly negative this possibility.

The pastilles can be obtained in this country, so that ringworm could

¹ *Lancet*, May 15, 1909.

be treated by anyone possessing an *x*-ray apparatus. It seems certain, however, as Geyser and other experienced radiotherapeutists have repeatedly admitted, that there is not as yet in our possession any reliable and satisfactory means for measuring the dosage of the ray. If accidents happen occasionally, even in the hands of experienced operators with all the resources of large institutions at their command, they would probably be much more frequent with less experienced and less well-equipped workers. The *x*-ray treatment of ringworm, while in many cases the best and quickest method of cure, should be reserved for extensive and inveterate cases, or for institution cases, and should be used only by experts in dermatological radiotherapeusis.

As regards the institutional care of these cases, American cities are far behind the times. I have previously called attention to the ringworm Schools at Paris, Brussels, and other places on the continent of Europe. In London, the Metropolitan Asylums Board maintains a resident School at Downs, with accommodations for 420 cases, as well as other schools for cases at home. It is stated that of the 750,000 children attending the elementary day schools in that city, 2950 annually suffer from ringworm of the scalp. Adamson,¹ who makes the report, believes this estimate to be very much below the real number. Most of the cases are treated with the *x*-ray, a staff of radiographers, medical attendants, and nurses being maintained. Previous to the general use of this method, the average stay of a child in the school was 19 months; after that it dropped to 5 months; in the last year for which a report is at hand (1909) it was only 4 months. Colcott Fox, in his annual report of the institution for 1908, may be quoted as expressing precisely the position of the radiotherapeutic treatment of ringworm. He says: "The prolonged experience of the *x*-ray method confirms the view that it is in many respects ideal, especially in regard to the important features of painlessness, certainty, and rapidity. But it is none the less true that this powerful agent demands, for perfect success, the most careful attention to all the details of application in the hands of an expert."

Adamson adds the information, however, that in spite of all that is being done in London to eradicate ringworm of the scalp, the number of cases coming from the day schools is constantly increasing. But little can really be accomplished until stringent measures are taken to prevent its spread in the elementary schools. Measures to that effect will probably soon be taken. The action or rather the inaction of our own municipal authorities has been in marked contrast to these vigorous measures. The public school inspection in the municipality of New York, so far as contagious scalp diseases go, is ridiculous, and the authorities do absolutely nothing of an effective nature. So our cases go on and on, decided upon by the hurried and perfunctory examination of the overtaxed medical

¹ British Journal of Dermatology, February, 1910, p. 46.

school inspector, and treated by a "visiting nurse," or relegated to the uncertain and insufficient care of the public dispensaries, or not treated at all.

Sarcoma of the Skin. This subject has not been reviewed in these pages for several years,¹ for the numerous articles which have appeared have not afforded any very important contribution to our knowledge of its nature or to our means of coping with its ravages.

DIAGNOSIS. The real nature of the affection is still a matter of dispute, the dermatologists in general regarding it as a true malignant newgrowth, while the general pathologists are rather inclined to look upon the tumors as the result of inflammation or infection. Other authorities give the disease an independent position between the two, using the name *sarcoid* to indicate its nosological position. Wallhauser is inclined to take this position,² believing that this is the best solution of the question, although it may be regarded as an evasion. Much seems to depend upon the personal attitude of the observer. Thus in a case which I recently saw at Beth-Israel Hospital, both the clinical features and the microscopic findings were in exact accord with those seen in a number of cases and recorded some years ago;³ yet the pathologist of the hospital looked upon the findings as those of an inflammatory granuloma. As a matter of fact, the conditions as regards sarcoma of the skin are exactly similar to those of carcinoma of that organ. Both affections occur in a form that may run a course closely resembling similar affections in the internal organs, or show one that is quite peculiar to the skin and seen nowhere else; or, finally, there may be an admixture of the two forms, either at the same time or by the development of one from the other. There is no clinical similitude, for instance, between the slow growing and comparatively innocuous rodent ulcer, or flat epithelioma, and carcinoma of the internal organs, yet no one doubts that both are true carcinomatous processes, developing, in the one case, from the pavement epithelium of the skin and mucosa, and, in the other, from the cylindrical epithelium of the glands. Occasionally they run into one another; we see the superficial affection, which may have remained quite on the surface, and but very slowly progressive, become deep, infiltrating, and destructive, like an internal cancer.

Exactly the same thing occurs with sarcoma of the skin. The typical sarcoma of the so-called Kaposi type appears as bluish or purplish tumors in the skin or just beneath it, growing very slowly, individual lesions coalescing into large, purple indurations, not ulcerating, and not affecting the patient's health save in so far as the extent, location, or tenderness of the lesions may interfere with the patient's exercise or avocation. Such lesions may retrogress spontaneously, or under treatment, and apparently remain practically quiescent for many years. I saw, only recently, a case of the

¹ *PROGRESSIVE MEDICINE*, September, 1904, p. 134.

² *Journal of the American Medical Association*, November 13, 1909.

³ *Journal of Cutaneous and Genito-urinary Diseases*, September, 1902

affection which I had lost sight of for about six years; his condition, both local and general, was certainly no worse than when I last examined him,

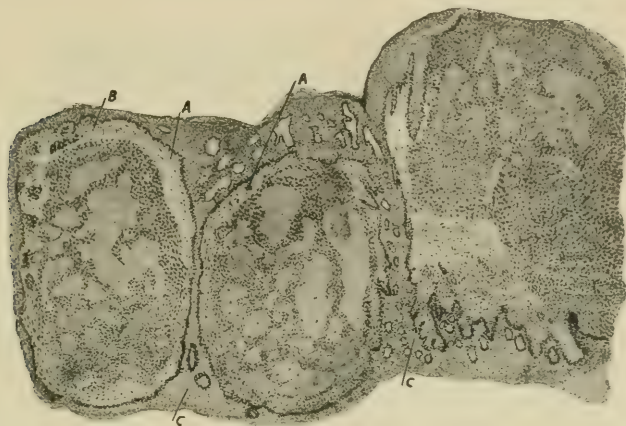


FIG. 28.—Sarcoma of the skin. (Wallhauser's case.)



FIG. 29.—Sarcoma cutis, Kaposi type. Quiescent tumors and infiltrations only. (Gottheil's case.)

and yet his was a true case of sarcoma, both clinically and microscopically. Fig. 29 shows the lesions of his feet. In Lebanon Hospital I have at the present time a patient showing both types. In addition to the character-

istic tumors and flat infiltrations of the skin of the extremities, he had and now has a number of prominent tumors, some walnut-sized and larger. Over the middle toes and dorsum of the right foot was a large, tuberous

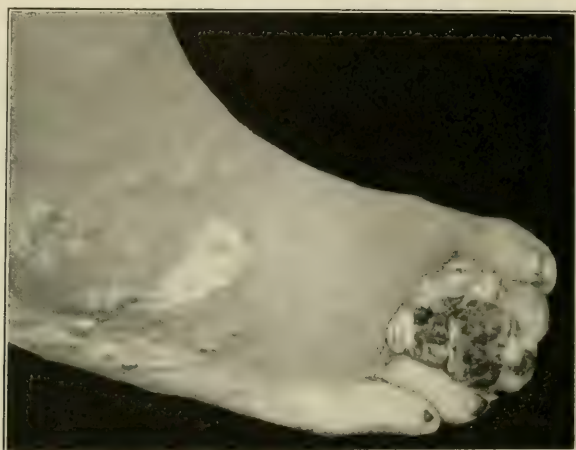


FIG. 30.—Sarcoma cutis, mixed type. Showing quiescent nodules and flat infiltrations together with rapidly growing exulcerated masses. (Gottheil's case.)

and exulcerated mass, which had consisted of quiescent nodules like most of those on his limbs, but which last summer had begun to grow rapidly and break down. The photographs were taken early in the summer; by the autumn the exulcerated masses had increased so much in size, and

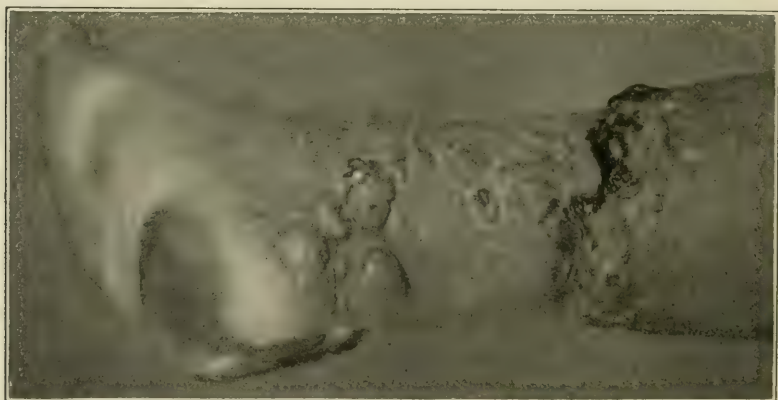


FIG. 31.—Sarcoma cutis, mixed type. Quiescent tumors and infiltrations with rapidly growing and exulcerated masses. (Gottheil's case.)

so many other tumors at the back of the leg had begun to enlarge and open, that the patient was anxious for amputation, which was accordingly done. Figs. 29, 30, and 31 show the dorsum and sole of his foot and the

back of his leg; in both of them, the quiescent nodules and flat infiltration can be seen interspersed with large, rapidly growing tumors and evidently very malignant cauliflower growths. The photomicrograph of one of the smaller nodules (Fig. 32) is, I think, convincing to the effect that the disease in this case, at all events, is a small, round-cell newgrowth and not an inflammatory granuloma. It is now four months since the operation, and all the other lesions on the arms, hands, legs, and feet have remained practically quiescent, advancing a little at times, and then receding again; whether as the result of the arsenical and radiotherapeusis that he is receiving or not, I am unable to say.

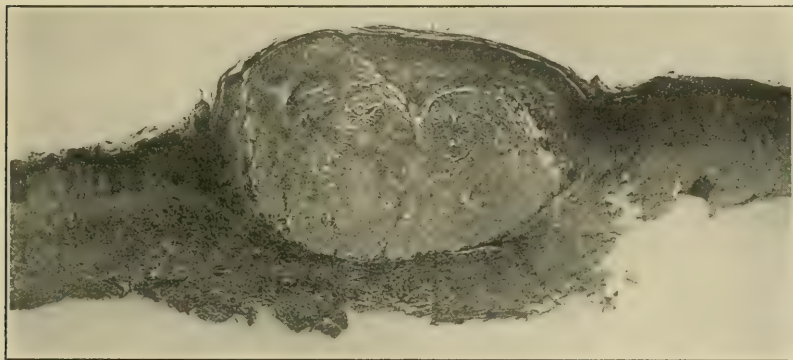


FIG. 32.—Sarcoma cutis, from case shown in Figs. 29, 30, and 31. Tumor sharply limited and composed of small round and spindle cells. It is apparently about to break through the epidermis at one spot. (Gottheil's case.)

Hartzell¹ believes that these tumors are true sarcomata, the case he describes being of the spindle-cell variety chiefly. Wallhauser's case (Fig. 28) showed distinct tumor arrangement similar to mine. The termination of these cases is by internal metastasis, although the course of the disease is so slow that they often die of other things. Of three that I have been able to follow to autopsy, only one died apparently of general sarcomatosis of the internal organs; the other two had renal and cardiac lesions which were the immediate cause of death. A peculiar feature of the affection is its prevalence among the Russian Jews; it is rare, of course, and I have not had more than eight or ten cases under my own care, but every one of them has been in people of this race. The experience of other observers is to the same effect.

TREATMENT. The original treatment recommended by Kaposi was *arsenic*. I have used it religiously, pushing it to the verge of safety; while it seems to have some influence in certain cases, it seems to lose its effect in time, and is not, in my opinion, a curative agent for the disease. *Radiotherapy* has its advocates, and I believe that its use is justifiable in a

¹ Journal of Cutaneous Diseases, March, 1909.

malady where our therapeutic resources are so slender and so ineffective. Personally, I have not seen anything more than retrogression of the lesions from its use and that for the time only. Lesser¹ recommends it. Its use is not without danger, Kanitz² records a case in which a severe toxemia ensued after its employment with fever, and exanthem, vomiting diarrhea, albuminuria, and cardiac weakness, followed by a fatal general metastasis. Coley's *mixed toxins* may be tried. Loeb,³ in a general review of this treatment for inoperable sarcoma, claims a cure in from 4 to 9 per cent. of the cases. I think this is more than is claimed by Coley himself. Wallhauser⁴ has gotten very excellent local results from the employment of *bichloride of mercury*, used as wet compresses in strengths of from 1 to 2000 to 1 to 500; the tumors disappeared under their influence, and in both his cases, did not reappear. It is only applicable, of course, to ex-ulcerated lesions, and can hardly be expected to have any effect upon the unbroken lesions.

Scarlet Red. Scarlet red, or, properly, scarlet "R" (toluol-azotoluolazo-B-naphthol), has recently been quite extensively employed to promote epidermization in a number of conditions of ulceration and destruction of the skin. Fischer found, several years ago, that this dye when injected in oily solution under the skin has a peculiarly stimulating effect upon epidermic proliferation, which might be pushed until a carcinomatous-like condition was produced. Cernazzi⁵ then used it externally to promote epidermization after skin grafting. Since then it has been employed and indorsed by a number of observers. Davis⁶ used it in 60 cases as a 2 to 20 per cent. vaseline ointment. When the wound was small, the whole surface was covered with the ointment; when it was large, it was applied only to the edges. It was painted on with a camel's-hair brush, or applied on perforated pieces or strips of gauze. As it is quite irritating, especially in the higher concentrations, it should be used for periods of twenty-four hours alternately with some bland ointment, and it was found well to protect the skin beyond the wound with some indifferent ointment. The lesions treated had lasted from a few days to fifteen years, and included the following diverse conditions: Partial skin grafts, 7 cases; ulcer following operation for infection, 10 cases; ulcer following burn, 11 cases; traumatic ulcer, 10 cases; specific ulcer, 8 cases; varicose ulcer, 7 cases; bed-sore, 2 cases, etc. The stimulant effect of the ointment was extremely marked, so that the higher percentages could only be occasionally and intermittently employed. The 8 per cent. ointment was the one generally employed, and Davis makes the important observation that sterilization

¹ Berliner klinische Wochenschrift, No. 3, 1909.

² Medicinische Klinik, 1909, No. 14.

³ Journal of the American Medical Association, January 22, 1910, p. 262.

⁴ Loc. cit.

⁵ Gaz. d. Osp., 1909, No. 14.

⁶ Johns Hopkins Hospital Bulletin, June, 1909.

does not seem to interfere with its efficacy, although the ointment turns slightly darker in color.

Auerbach¹ has employed scarlet red in 4 per cent. ointment after incision of buboes, in chancroid, inflammatory phimosis, luetic ulcerations, lupus vulgaris, and bedsores, often with a surprisingly quick result. Similar experiences are recorded by Morawetz² in two cases of varicose ulcer of the leg and one of intertriginous ulceration; he recommends the scarlet red ointment in all cases of extensive and obstinate ulceration. Dauthuille³ employed it in an enormous ulceration following gangrene of the skin of the thigh and measuring 27 by 10 centimeters; it was completely healed in three months, whereas the attendants estimated that it would take at least eight or nine months to close under the old methods. Some of the investigators have been so pleased with the results attained that they have not hesitated to recommend it in the place of skin grafting in extensive ulcerations and burns.

My own experience with it, although limited, has been satisfactory as far as it has gone. It seems to be a most manageable stimulant to epidermic proliferation, giving almost as good results as the daily judicious employment of the nitrate of silver stick. I would suggest its employment as a thin ointment, to be painted daily over the margins of the ulceration in advance of the epithelium, and not stronger than 10 or 12 per cent. If the whole surface is to be covered, commence with a weak ointment, 2 to 4 per cent., and gradually increase its strength as conditions demand. It should be applied on thin gauze and covered with perforated rubber tissue, so as to permit free outflow of the secretions.

Tar and Tar Baths. It has been said, and with reason, that the skill of a practitioner in treating chronic dermatoses may be measured by the use he makes of tar, for there are few more powerful remedies for a variety of common conditions. Yet it is of all ordinary drugs one of the most rarely employed. As an antipruritic in pruritus and prurigo; for the cure of the chronic stages of most forms of eczema and dermatitis; for the relief of psoriasis and all the scaly affections, there are few remedies so generally useful as this neglected one. Possibly this may be due to the unpleasant odor and color of the *pix liquida*, but we now have at our disposal a number of improved preparations to which some recent writers have again called attention.

For general use in ointments, the birch and boxwood tars, *oleum rusci* and *oleum fagi*, are far preferable to the crude preparations, being purer, thinner, lighter in color, and having much less odor. I habitually employ the *oleum rusci rectificati* as being the least irritating and least disagreeable of the series, adding it in various proportions (2 or 20 per cent.) to the zinc, salicylic, or bismuth ointments indicated for the affections treated. The

¹ Klinische Therapeutische Wochenschrift, 1909, No. 24.

² Therapeutische Monatshefte, 1909, No. 9.

³ Nord medical, August 1, 1909.

liquor carbonis detergens, an English preparation, is now obtainable here, and is a very desirable tar preparation; it may be used pure, or diluted with various proportions of cottonseed oil or in an ointment. Most useful of all, however, are the *tar baths*, for the ready preparation of which a number of formulæ have recently been given. Thus Spiegler¹ recommends the following:

1. Ol. rusci, 100 grams; pure liquid ammonia, 10 grams; stir well.
2. White gelatin, 10 grams; water, 50 grams; dissolve over water bath.
3. Crystallized sodium carbonate, 10 grams; water, 50 grams; dissolve warm.

Mix 1 and 2, then stir the mixture into 3 until it coagulates. For use, dissolve the gelatinous mass in warm water and add to the bath.

A still simpler formula is given by Taege:² Ol. rusci, 150 grams; liq. kali caust. (Ph. Germ.), 90 grams; shake and add to $\frac{1}{2}$ liter of alcohol. This is to be poured into the bath in a thin stream, mixing well. It is agreeable, cheap and clean.

Either one of these formulæ will afford an efficient remedy for the more generalized chronic, itchy, and inflammatory dermatoses.

SYPHILIS.

The Anonym of the Palatinate. Thibierge³ has recently published some new facts concerning the syphilographer who has been known for half a century by this title alone, and to whom is due some of the most important advances in our knowledge of lues. About the year 1850 syphilis inoculation experiments on the healthy man were made by a physician of the Palatinate, thus demonstrating the contagiousness of the pus of the lesions of the secondary stage—still denied at that time by no less an authority than Ricord—and of the blood at the same period of the malady. Tradition has it that the author of these experiments concealed his name for considerations which Thibierge calls “respectable,” but which I should prefer to designate as “prudent,” and his experiments were reported to a learned society by confrères who guaranteed their accuracy, but did not reveal the name of their author. They have since been known as the “Experiments of the Anonym of the Palatinate;” and it was lately announced that the author in question had reached an advanced age, but that his name would not be revealed until after his death.

The precautions taken to conceal the identity of the experimenter were in so far successful that it did not become generally known, although Professor E. Hoffman,⁴ in the report of his experiments upon the infec-

¹ Dermatologisches Centralblatt, March, 1909, p. 173.

² Münchener medizinische Wochenschrift, 1909, No. 14.

³ Annales de Dermatologie et de Syphilographie, June, 1909, p. 415.

⁴ Aerztliches Intelligenz-Blatt, 1856, p. 425.

tiousness of the blood of syphilitics, states that he knew the real name of the author of the experiments, but would not mention it.

Bing¹ has searched the minutes of the Society of Physicians of the Palatinate, published in the *Aerztliches Correspondenz-Blatt* for the years 1850 and later, wherein are mentioned the remarkable experiments of a certain Dr. Bettinger, Director of the General Establishment for the Care of the Poor and Sick at Frankenthal. He had made a report of the very highest interest, by which the contagiousness of secondary syphilis was demonstrated with mathematical certainty; showing that not only the pus from secondary lesions, but the blood also of the patients showing them would, when inoculated into healthy individuals, cause the appearance of characteristic lesions of secondary syphilis, thus definitely and for all time deciding the question of the contagiousness of these fluids. In the minutes of the same society for 1855, in the course of a discussion on vaccinal syphilis, this Dr. Bettinger took a modest part, but enunciated ideas in exact conformity with those of the Anonym. Thereupon Dr. Jacob, secretary of the Society, called the members' attention to a communication that bore upon the subject under discussion, and that would decide the question under debate. By reason of certain special circumstances a confrère had found himself in a position to be able to make certain experiments as to the contagiousness of syphilis, without offending the laws of humanity, and with a scrupulous observance of the conditions under which such researches were justifiable. Those to whom this communication was addressed could vouch for its veracity, as well as for the scientific rigor with which the experiments had been made. Dr. Jacob thereupon detailed these experiments, which were made on twenty-three patients, all of whom had never had syphilis before, and who had all been over three years under observation since that time. Fourteen were inoculated with the pus of secondary lesions, eleven giving positive results; and nine were injected with the blood of secondary syphilitics, of whom three gave positive results. Bing concludes that there can be no doubt that the Anonym of the Palatinate was this Dr. Bettinger, who was an accurate and painstaking observer, and the author of numerous other communications on syphilis during these and the subsequent years,

It would be of interest to know the details of these experiments, not for the purpose of drawing conclusions on phases of the subject that are settled, but as a historical and psychological study of the lengths to which scientific ardor may go.

The New Methods of Syphilis Diagnosis. I have had occasion at various times in the reviews of the last few years to discuss the spirochete and the Wassermann reaction; both subjects have now been so thoroughly worked up that a brief inquiry as to their value in every-day practice, which

¹ *La Chronique médicale*, May 15, 1909, p. 305.

of course is the ultimate criterion of their usefulness, is in order. Van Riemps¹ has recently detailed the various methods of making these tests.

It is universally admitted today that the *spirochete* is present in all syphilitic lesions, early and late; that it has a definite relation to their pathological changes; that it is found in animal syphilis also; that together with the disappearance of lesions under treatment, it vanishes; and that although it has not yet been obtained in pure culture, there is now quite sufficient evidence to entitle us to regard it as the etiological factor of the disease. It is therefore a diagnostic factor of prime importance; and since it is present at the very beginning, in the chancre itself, the value of its microscopic recognition cannot be overestimated. The material to be examined must, however, be taken in a certain way, and with care, for a microscopic body of such extreme tenuity may be readily masked by extraneous matter.

The suspicious lesion must be thoroughly cleansed and its floor thoroughly scraped with a sterile curette. When all blood flow has ceased, the area is cleansed again, and a drop of the clear serum which oozes out is spread in a very thin film on a slide. The smear can be examined stained with the ordinary immersion objective, or unstained, with the dark field illuminator. I usually employ the latter as being quicker and more convenient.

This dark field illuminator is an inexpensive piece of apparatus by means of which all the central rays from the microscopic mirror are cut off and only the very oblique ones reach the objective, so that objects on the slide become luminous from refracted light. An intense source of light is required; a Welsbach mantle can be used, but I prefer the miniature arc lamp that is supplied with the illuminator, and which can be run on the ordinary electric-lighting current. The specimen is examined moist, the coverglass being sealed with vaseline or paraffin to prevent evaporation, and the moving spirochete becoming visible as brilliant objects in the dark field.

For stained specimens, the smear is dried and stained with the Goldhorn fluid. There are many different methods, but this stain can be obtained already prepared and with easy directions for its use. The technique requires care and some practice, but both these methods of spirochete examination can be used by anyone moderately skilled in microscopic technique.

It is otherwise, however, with the *Wassermann reaction* and its various modifications and substitutes. This is so complicated and requires so much experience, care, and study that only an investigator in a well-equipped laboratory, who has devoted special attention to the subject, is capable of making it. Even in our largest cities it is done only by a few men. It has been found positive in a sufficiently large proportion of cases of syphilis of all kinds to render it extremely valuable as a means of diag-

¹ New York State Journal of Medicine, December 1909.

nosis in doubtful cases; but it is indispensable only in obscure late lesions. The only thing to do when its aid is needed is to send the patient to some one competent to make the test.

Reviewing both these diagnostic means we must conclude that they form most valuable resources in syphilis diagnosis, and enable us to diminish the number or entirely eliminate doubtful cases. Not only can we make a positive diagnosis of a chancre, a secondary lesion, or an internal affection more easily, more certainly, and earlier, but we can decide when a patient can be considered cured or marriageable; we can regulate treatment; we can decide one important element in the availability of wet-nurses; and we possess an additional means of treating our syphilophobics in so far as they are susceptible to treatment at all.

New Suggestions, and Some Old Ones, in the Treatment of Syphilis. In spite of the constant stream of articles upon the treatment of this disease, I do not think that anything has been brought forward during the last few years, in the shape of new drugs or new methods, which would lead one to modify, in any important particular, the suggestions made on this subject in previous reviews.¹ Undoubtedly the *injection treatment* is gaining ground. The insoluble mercurials, in spite of, and perhaps because of, the active criticism to which their use has been subjected, are being more and more largely employed. The choice between the various preparations of both kinds is largely a matter of individual predilection and individual skill. Trimble, in a recent article,² recommends them all rather impartially, but he puts the bichloride at the head of his soluble, and calomel at the head of his insoluble list, and these two certainly suffice. Nevertheless by far the majority of all the cases of syphilis in the world are still treated by internal medication. In fact, fashion has a good deal to do with the therapeutic method employed, as Rothschild depicts it.³ The Englishman, with but little time to spare from business or pleasure, takes his medicine in the form of pills or powders. The Frenchman revels in the elegance of the hypodermic syringe. The serious-minded and systematic German prefers the blue ointment externally. The American, with his happy-go-lucky disposition, has no special preference, and supplements the above methods by the liberal use of sarsaparilla. In Central and South America, regarded by some as the home of the disease, herbal concoctions are relied upon to cure it; and Rothschild makes a plea for the employment of fluid extracts of sarsaparilla, sassafras, guaiac, and cinchona bark, although he concedes to mercury the first place as a therapeutic agent.

Jonathan Hutchinson,⁴ in the new edition of his book, remains, as might

¹ PROGRESSIVE MEDICINE, September, 1906, p. 143, and September, 1908, p. 140, more especially.

² American Medicine, new series, vol. iii, December, 1908.

³ Folia Therapeutica, January, 1909.

⁴ Syphilis, Cassell & Co., 1909, p. 517 et seq.

be expected, a vigorous advocate of the *buccal administration* of mercury, and prints in capital letters the cases which illustrate his warning against the dangers of the newer methods. This is not the place to answer him, although similar cases might be cited with just as much emphasis where untoward results have followed the ingestion of the drug. We shall not on these accounts abandon either method any more than we shall give up general anesthesia because an ether pneumonia or a chloroform death occurs in a certain number of anesthetics.

Leissl¹ still defends the *symptomatic treatment*, being perhaps the most eminent advocate left of the uselessness of prophylactic therapeutics; he holds that a preventive general treatment interferes with the spontaneous defensive processes of the organism. This will not appeal to American physicians, and still less to their patients; a problematic future benefit having little weight as compared with the immediate good of avoidance or mitigation of the earlier symptoms.

A useful suggestion for the treatment of ulcerative and destructive syphilids has been made by Hamel.² It may be used in conjunction with the general treatment, or when this latter is impossible or has proved ineffectual, or if there are intestinal, kidney, or gum affections which interfere. He used the treatment in 16 cases, employing the following technique: A very fine needle is inserted obliquely under the lesion, and enough of an isotonic solution of mercury cyanide, 1 to 2000, is injected, to cause considerable infiltration. He reports excellent local results. The idea appeals to me, although I have not yet had occasion to employ it. We know that the mere external local use of mercury has a most powerful effect in causing the rapid disappearance of ulcerated and even of non-ulcerated syphilitic lesions. We know also that syphilitic lesions will not appear in dermal tissues which are more or less permanently infiltrated with mercury, even in insoluble form. A brilliant example of this has recently been recorded by Dohi.³ A patient, whose entire body was very elaborately tattooed in the Japanese manner with figures of gods, flowers, etc., in blue black and red, contracted syphilis, and had an abundant general papular eruption.

On the non-tattooed portions of his body, the neck and arms, the papules were moderate in number, and isolated. On the portions tattooed blue black with Indian ink, they were much more numerous, being thickest where the pigment was deepest and the irritation greatest. On the portions tattooed red, where cinnabar had been employed, not a single papule was to be seen. Diagonally across the patient's back and occupying about half its area was a large figure of the head and chest of a god. The flesh of the face and trunk, colored red with cinnabar, showed not a single papule; but the black hair of the god was full of them; there was a row of

¹ Medizinische Klinik, April 12, 1909.

² Annales de Dermatologie, May, 1908.

³ Archiv für Dermatologie und Syphilis, May, 1909.

them along the black eyebrows; even one on the black iris of one eye, and the black lines which marked the folds of the skin and the protuberances of the muscles showed many of them. The numerous red flowers strewed over the rest of the back were also entirely free from lesions. A more striking example of the effect of the local presence of mercury in the skin, even in insoluble form, could not be given. That the mercury must have been present in insoluble or almost insoluble form is proved by the fact that the man was thirty-five years old, and had been tattooed at the age of nineteen, sixteen years before.

Crume¹ makes a plea for the *intravenous injection of mercury*. He admits that the technique is a little delicate; that in women and in the obese, the veins are not always sufficiently prominent to permit its being done; and that Fournier asserts that it is imprudent to bring the endocardium in direct and sudden contact with such a toxic agent as mercury. He does not advise it as a routine method, but uses it when it is necessary to act very quickly or to make a therapeutic test rapidly. Its advantages are absence of pain, mathematical dosage, and instantaneous introduction into the circulation. It seems to me that the great care necessary in preparing the solution, the need of an assistant at the injection which Crume admits, are valid objections to the method; the more so as the operation would have to be very frequently repeated, since mercury introduced into the blood is certainly excreted with extreme rapidity. It seems to me to have all the objections of the soluble injections in heightened degree, with some very serious possibilities of its own. Fournier admits that he has never tried it, and I confess the same.

The *mineral water treatment* of the disease is advocated again by De la Carrière,² but he does not attribute the favorable results attained to any effect of the waters upon the disease itself. It is due to the combination of the sulphur with the insoluble mercury albuminate, transforming it into a soluble mercuric-sulphate. The sulphur waters are supposed to act upon the mercury which remains stored up and inert in the organs, rendering it soluble and restoring its therapeutic power long after its ingestion. This is the theory advocated by some practitioners at the various springs where syphilis is more especially treated, but the same claims are made for other waters and even for mud baths. They do not rest on any very sure foundation, and I know that the physicians in these places treat syphilis exactly as everyone else does. Some of them have been students of mine and use the insoluble injections as I advise. The springs are useful in two ways only: they enable a patient with manifest evidences of disease to get away from his friends, and he gets the advantage of change and rest.

Ward³ breaks a lance again for *atoxyl*, claiming to have had much success from its use. Injections were given every other day, and symptoms

¹ Journal of the American Medical Association, December 19, 1908.

² Presse Médicale, August 12, 1909.

³ Journal of the Royal Army Medical Corps, April, 1908.

disappeared after eight to ten injections. This means from two or three weeks; sufficient time for some of the early manifestations of the disease to disappear spontaneously. We now realize the dangers of atoxyl, and but little is heard here of its therapeutic employment. As a matter of fact why, save in the interest of the drug manufacturers, should we search farther afield for drugs to influence the luetic infection when we already have the choice of so many effective preparations and methods at our disposal?

Lenzmann¹ has revived the treatment of syphilis with *quinine*, modelling it on the dosage of arsenic in the trypanosome affections. He administers the drug by intravenous injection and intramuscularly. He claims to have gotten very prompt results, but he only advises the treatment when mercury fails, or is not tolerated. There are reports on record years ago of the efficiency of this medication, and the effect of the drug on the malaria plasmodium in the blood may well incite us to try its effect on the spirochete again. Napp,² in an independent investigation, confirms Lenzmann's results.

In a paper read by Klot³ at the Section of Cutaneous Medicine and Surgery of the American Medical Association, the author in a very convincing and scholarly manner, plead for the injection treatment, and especially for the general use of the insoluble preparations of mercury. In the discussion which followed, such authorities as Zeisslerr, Heideingsfeld, Hay, and others professed their thorough belief in the efficacy and scientific thoroughness of the method.

Practical Uses of the Wassermann Serum Test in the Prognosis and Treatment of Syphilis. Fairly extended consideration was given last year to the consideration of the serum test,⁴ and the conclusions as to its utility have been in the main confirmed by the great multitude of observations which have been published in all departments of medical work. Attempts to simplify the technique have been continued, but it cannot be said that any of them have been successful in giving us a method which is available to the profession at large. Unfortunately, the test can still only be made in especially equipped laboratories, and by experts.

Where such are available, however, the tendency to make the test the criterion of diagnosis, prognosis, treatment, and cure is very marked. Rus-sowich,⁵ for instance, employs it always in the so-called "latent" cases, to determine whether the patient is well or sick; he holds that a positive reaction is an absolute indication of the need of further treatment. Lesser⁶ as the result of a long series of experiments upon patients under treatment,

¹ Deutsche medizinische Wochenschrift, March 5, 1909.

² Ibid., May 21, 1909.

³ Journal of the American Medical Association, December 5, 1908.

⁴ PROGRESSIVE MEDICINE, September, 1909, p. 153.

⁵ Monatshefte für praktische Dermatologie, December 1, 1908, p. 585.

⁶ Deutsche medizinische Wochenschrift, March 4, 1909.

finds that the ordinary treatment is entirely insufficient to transform a positive into a negative reaction; the mercurial courses, therefore, should be much longer and much more intense. The positive reaction becomes weaker under treatment, increases when it is stopped, and again becomes attenuated upon resuming it. It is interesting to note that he found that the use of alcohol interfered with the attenuation of the reaction. Lesser goes so far as to say that formerly we only judged by the surface skin indications; now we look into the depths. His material included over 2000 cases, in addition to hundreds of healthy persons tested as controls. Blaschko,¹ as the result of his study of 1000 cases, claims that treatment should be continued until the test becomes permanently negative. Bering² elaborates and considers all the aspects of the reaction in the light of his own extensive experience, as well as the results obtained by others, and concludes:

1. The serum reaction is specific.
2. Clinical examination and the serum reaction must mutually sustain one another.
3. For therapeutic purposes, a positive serum reaction is equivalent to an active symptom.
4. Like every other active symptom it is the indication for energetic treatment (mercury and iodine.)
5. Serum investigation confirms the opinion that the chronic intermittent mode of treatment gives by far the best prognosis.
6. The early mercurial courses, and especially the first one, are of decisive importance as regards the course of the disease. The more energetic the course, the earlier does the serum reaction become negative.
7. Treatment is to be begun as soon as possible, even before the appearance of a positive serum reaction if it can be done.
8. The abortive treatment, that is, treatment after the appearance of the spirochete, and before that of the serum test, is the ideal one.

Of course, the great majority of our syphilitics must for the present, and, I am afraid for a long time to come, do without the advantages offered by the new methods in the diagnosis, prognosis, and treatment of their infection. Where the facilities of the larger medical centres are not accessible, decisions must be made, treatment must be instituted and stopped in accordance with the older well-known and readily accessible indications. Yet a good deal can be done to make some use of the new knowledge, even away from the centres. The early diagnosis of a suspicious lesion, than which there is no single factor more important for the patient's life and health, is not a difficult matter. The microscopic recognition of the spirochete requires some practice, but, with the simpler stains now devised, or with the dark stage that all the microscope makers now supply it is quite within the range of anyone familiar with microscopic technique.

¹ *Deutsche medizinische Wochenschrift*, March 4, 1909.

² *Archiv für Dermatologie*, October, 1909.

Where that cannot be obtained the patient should, if possible, be sent where it can be done. The examination itself can be carefully done in an hour or less. The serum examination is a more difficult matter. It should be done only by experts, since only their reports, especially in negative cases, can be relied upon. It takes some days, but the patient need devote only the time required to take the specimen to it; the report can come later. In view of the transcendent importance of the questions: Has the patient syphilis or not? is the treatment sufficiently vigorous to cope with the infection or not? has it been kept up long enough or not? can marriage be allowed? and many others, it seems to me that even periodic journeys for the purpose of having the serum test made would, when possible, be entirely within the bounds of the properly recommendable. It seems fairly well established that we have at last not only a definite index as to the existence of syphilis when the ordinary physical signs are absent or indeterminate, but also a test to determine the sufficiency and the efficacy of the treatment, and to decide upon the patient's future prospects and the course of life which he ought to pursue.

The Prevention of Infection with Syphilis. Three years ago I reviewed the experiments, then new, which had been made by Metchnikoff¹ with a view of preventing systemic infection in cases that had been exposed to the contagion. It seemed then that if excision of a suspicious or possibly infected lesion of the skin was impossible the local use of a 33 per cent. calomel ointment promised the best results. A trial had even been made in the human subject, an indubitable inoculation being made, the treatment employed one hour later, and the subject entirely escaping infection. Of course, it is only in exceptional cases that such immediate treatment will be possible; but there seems to be some reasons to believe that there is a possibility of succeeding in cutting short an implanted infection even after the lapse of a longer period. Thus Wolbarst² reports the cases of two men who both had intercourse with a syphilitic woman. One man used a 30 per cent. calomel lanoline immediately after coitus, and escaped infection; the other did not, and got a chancre. Of course, the cases prove nothing positively, since the first one might have escaped anyhow; luckily not every intercourse with an infected partner is followed by the disease. Others authorities, however, have expressed themselves as greatly in favor of the method, notably Neisser,³ who recommends energetic washing with bichloride 2 or 3 to 1000, followed by wet applications of the following: Mercury bichloride, 4 grains; sodium chloride, 8 grains; alcohol, 10 drops; distilled water, $\frac{1}{2}$ dram; glycerin, $3\frac{1}{2}$ ounces. As an example on the other side I may cite Vorberg,⁴ who used the calomel salve in two cases without effect and concludes that the measure is useless.

¹ PROGRESSIVE MEDICINE, September, 1907, p. 129.

² Medical Record, October 24, 1908.

³ British Medical Journal, October 10, 1908.

⁴ Archiv für Dermatologie, December, 1908, p. 469.

Of course, if a patient escapes infection after a suspicious or a positively infective intercourse with these prophylactic measures no one can say positively that these latter saved him. On the other hand, the measures are so simple and so readily employed that they may be recommended even for the sake of the slightest possible chance of their being efficacious. Though I am not able to pass a definite judgment as to their usefulness, my practice is as follows: I recommend the free use of bichloride lotions after intercourse. Later I employ the calomel ointment for a number of days. If there is a lesion suitable for excision, and the patient will permit it, that is done. If the lesion is unsuited for operation, or the patient refuses to have it done, or there is no microscopic lesion at all, I use the ointment as above.

Syphilitic Diabetes. The action of the specific virus on the human system is so varied that the phenomena of almost any affection may, under certain circumstances, be imitated. So marked is this in the case of the integument that the older writers were perfectly justified in speaking of a syphilitic varicella, a syphilitic acne, and a syphilitic psoriasis. We have properly abandoned this nomenclature today, recognizing the fact that external resemblances lose their importance for purposes of classification as soon as deeper etiological data are obtainable. We are also appreciating more and more the fact that symptoms of many internal affections may at times be occasioned in the same way, and be amenable to the regulation treatment.

It has long been known that a temporary glycosuria may occur coincident with the appearance of a syphilitic exanthem. Ehrmann¹ has recently studied this phenomenon in connection with a marked case of this kind. There was thirst, hunger, polyuria, 8 per cent. of sugar, and marked acetic acid and acetone reactions, all of which symptoms disappeared with great rapidity under inunctions and an anti-diabetic diet. In eight days the phenomena had disappeared, so that the patient could take 150 grains of grape sugar without any sugar excretion in the urine. Ehrmann believes that the temporary stoppage of the intestinal pancreatic reaction was caused by the spirochete products. Bayet² records a similar case, in which diet had no effect, but which was cured by antiluetic treatment. I have at the present moment under observation a case illustrating the occurrence of similar phenomena at a later stage of the disease. The patient, who comes from a distant town, was infected many years ago, and, according to the statement of his physician, has had several similar attacks during the last few years, all of which have yielded promptly to antiluetic medication. In the pancreatic region there was an indistinctly definable but quite evident mass, somewhat nodular. There was excessive thirst,

¹ Archiv für Dermatologie und Syphilis, May, 1909, p. 122.

² Bulletin de la Société Belge de Dermatologie, vii, No. 1.

great polyuria, emaciation, and 2 per cent. of sugar, and fat in the stools. The diagnosis was gummatous infiltration of the pancreas. Recovery from the immediate symptoms under mercurial injections was very rapid.

These cases emphasize the validity of the advice to make a freer use of the mercurial treatment in many cases in which there are elements of obscurity in the diagnosis, even of affections not commonly supposed to be syphilitic in their origin. The old practice of giving iodide of potassium where there is no distinct indication for other medication is not entirely indefensible, and I would add mercury to the recipe. So long as we have no definite and positive criteria for differentiating a syphilitic from a non-syphilitic diabetes, an exulcerated gumma of the stomach from the beginning carcinoma, a chronic pneumonia from a specific inflammation of the lung, the treatment should be tried. I should not regard either the patient's history or the results of a Wassermann serum test as determinative, more especially as the treatment, if properly carried out, is entirely innocuous.

Syphilis d'Emblée. This rather cumbersome French designation has been generally accepted to designate those instances of syphilitic infection in which no initial lesion can be found. This is not infrequent in the experience of all who see many cases of the disease, and although the subject is not of practical importance when once the diagnosis has been made, it is of considerable scientific interest. Is it possible to sustain this infection without the appearance of a demonstrable site of invasion, or is non-success in finding it to be ascribed to accidents of appearance or location? The syphilological world has been more or less divided on the point; two recent writers, Bettmann¹ and Waltsh,² have gone into the matter exhaustively, and conclude that syphilis d'embleé does occur.

There are a number of circumstances which may lead to the non-recognition or non-finding of an initial lesion even when it is present. In the first place the chancre is frequently an apparently insignificant affair, especially when non-ulcerated; a mere painless papule which the careless patient, and even the physician, may pass unnoticed. Again, it may be seated in a concealed location, as in the urethra, where the discharge which accompanies it is taken for a gonorrhea; or in the rectum, where it may well run its course unnoticed; or deep in the buccal cavity, where it may well be misinterpreted (I have known a chancre of the tonsil to be ablated by a prominent laryngologist under the impression that he was dealing with an inflammatory hypertrophy of that organ). I believe that in some cases implantation of the virus may occur in the posterior pharynx, or even lower still in the alimentary tract, or in the nasal passages, where it would be either invisible or misinterpreted. Further, certain varieties of chancre well recognized by the syphilographers do not

¹ Archiv für Dermatologie und Syphilis, February, 1910, p. 145.

² Archives de Dermatologie et de Syphilographie, February 10, 1910, p. 98.

resemble the ordinary initial lesion at all, as is the case with the parchment induration, where there may be merely a tenuous small plate in the skin or the sclerotic edema, which resembles a chronic cellulitis, both of which show neither tumor nor ulceration. The difficulty of diagnosis in some cases is very great, as is shown in a case of my own. A young man came to the Lebanon clinic with a hard, sharply circumscribed, insensitive mass in his left cheek, slightly exulcerated on the surface. Its appearance and feel was that of a chancre; there was a large, painless, and stony-hard swelling of the gland under the angle of the jaw on that side, and although a spirochete examination was not made on account of haste, the diagnosis of an initial lesion of the cheek was made. In the course of a few days, however, the swelling became larger, redder, and more sensitive; it began to soften, and finally turned out to be a cellulitis developing under a superficial ulceration of undetermined nature.

From the cases supposed to be instances of syphilis without a chancre, these cases must be deducted, but so many cases of syphilis d'emblée have been reported by competent observers that the evidence seems to be in favor of the possibility of its occurrence. It is probably much rarer, however, than is often supposed.

Syphilis of the Liver. Of all the internal organs, one of the commonest to be affected by syphilis, both of the hereditary and the acquired type, is the liver. Fouquet¹ has proved that in heredo-syphilis the liver is the favorite seat of the spirochete; they are found massed perivascularly throughout the organ. The liver is almost invariably found greatly affected when the cases are examined; it is enormously enlarged, and either diffusely inflamed or studded with gummata in various stages of development.

Ebstein² considers the possibility of syphilis in every case of chronic liver disease, especially when the diagnosis is at all obscure. Edwards³ calls attention to the closeness with which luetic disease of the liver simulates other affections—cancer, abscess, and cirrhosis. It is frequently impossible to make the differential diagnosis from the symptoms alone; the serum test and the therapeutic test must be employed. The size, activity, and importance of the organ makes it the commonest of all the abdominal viscera to be affected by the virus. In heredo-syphilis, the lesion may be inflammatory, leading to cirrhotic changes; or it may be gummatous, the organ being studded with isolated or confluent tumors.

In acquired syphilis, jaundice is not infrequent in the earlier stages; it usually passes off quickly under treatment, and is probably inflammatory, like the other early symptoms. Later, a distinct hepatitis may occur, with pain, ascites, icterus, and emaciation. Gummata of the liver may simulate abscess, there being fever, chills, hepatic tenderness, pain,

¹ Archiv für Dermatologie und Syphilis, November, 1908, p. 280.

² Deutsches Archiv für klinische Medizin, 1908, xvi.

³ Journal of the American Medical Association, October 2, 1909, p. 1122.

enlargement, leukocytosis, emaciation, and even fluctuation. When the gummata are central and the local symptoms not prominent, the affection may simulate malaria, typhoid, tuberculosis, or septico-pyemia. The most chronic cases appear like ordinary cirrhosis, or a pylephlebitis, like that from sepsis, may occur. Acute yellow atrophy of the liver occurs in syphilis, as in certain poisonings and other infections. Its symptoms, especially in the early stages, may be slight, being limited to alimentary levulosuria, urobilinuria, icterus, etc., later local tenderness, deep jaundice, coma, and other symptoms show the severity of the affection. It is noteworthy that in two cases of fatal acute liver atrophy in syphilis which have recently been recorded,¹ no spirochete were found in the liver, though there were numerous organisms found in the skin lesions in one of the cases. The atrophy is supposed to be occasioned by the spirochete toxins; like other poisons they cause degeneration of the parenchyma of organs, and necrosis of the secreting cells.

SYPHILIS MALIGNA.

In the great majority of cases the luetic disease runs a course as regular as that of the acuter general infections. In the one case, as in the other, no one can foretell just what symptoms will appear, or when, but there is in ordinary cases of syphilis, as in uncomplicated cases of scarlatina or measles, a fairly regular sequence of events. Primary incubation, initial lesion, secondary incubation, secondary symptoms, tertiary phenomena, and sequelæ appear in their order, and run a definite course. The later we get in the infection, of course, the less possible does correct prognostication become, but in a general way, and especially in properly treated cases, the rule holds good.

Occasionally, however, and happily more rarely today than in years gone by, we meet with cases which set all rules at defiance; cases in which the infection seems so virulent, or the conditions so favorable to its ravages, that all order and sequence of phenomena are lost, and the luetic infection presents a picture which rather resembles the sixteenth century syphilis which we read about than the tractable and rather mild infection which we are accustomed to see. Some of these cases are exceptionally severe from the beginning, and run an abnormal course, sometimes to a fatal termination. Others begin in the ordinary way, and then change their type. Others, again, at first severe, seem in time to lose their threatening characteristics. All such are true cases of malignant syphilis.

In a typical malignant case all the symptoms are exceptionally severe; their outbreaks occur with great rapidity, and the usually orderly sequence of events may be entirely lost. The initial lesion ulcerates extensively, or is sloughing and phagedenic; the secondary exanthem

¹ Fischer, *Archiv für Dermatologie*, December, 1908, p. 466.

is pustular or ulcerative; the mucosæ are early and extensively affected; the phenomena of iridocyclitis, meningeal troubles, and systemic involvement marked by high remittent febrile movement, loss of appetite, rapid emaciation, etc., soon reduce the patient to a pitiable condition. The most marked phenomenon, however, and the one which at once attracts attention, is the occurrence very early in the disease of deep rupial and ecthymatous ulcerations in the place of the usual macular or papular exanthemata.

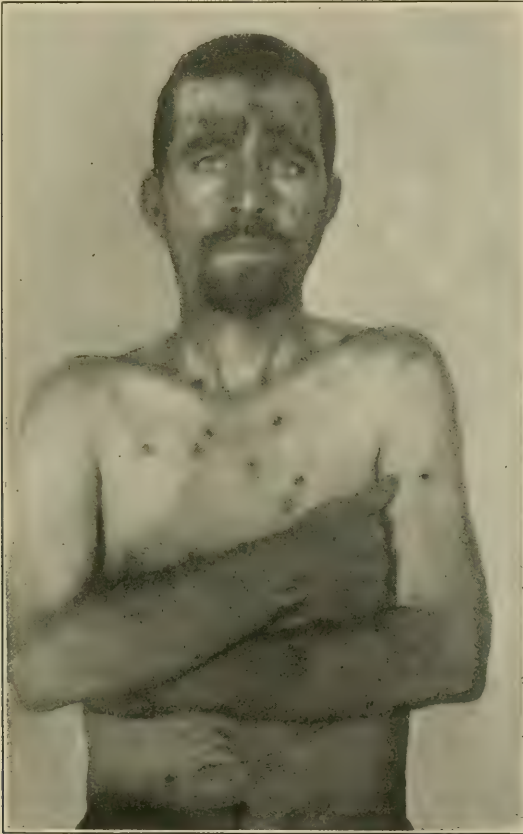


FIG. 33.—Syphilis maligna. Early secondary pustular and rupial eruption. (Gottheil's case.)

The accompanying cases will illustrate some of the phases of this distressing form of the disease. Fig. 33 is the picture of a patient who was in the skin ward of the City Hospital; he was in the very early stages of the affection, the initial lesion being still present and the eruption being his first cutaneous outbreak. It was pustular and pigmented on the body, and ulcerated and rupial on the face; he had a very severe infection and was many months in the hospital, but ultimately re-

covered. Fig. 34 shows one of the most malignant cases I have ever met. The young girl had a general tuberculopustular and pigmented secondary eruption, gummatous ulceration of the eyelids, iritis, extensive ulcerations of all the mucosæ, alopecia, and profound systemic involvement. There was no checking the advance of the disease, which terminated fatally. Fig. 35 is a malignant case a little later in the infection, still in the late secondary or early tertiary stage. The immense fram-besioid ulcerations and the extreme emaciation of the patient are well shown. The patient finally recovered.



FIG. 34.—Syphilis maligna. Early secondary pustular and gummatous eruption. (Gottheil's case.)

Malignant syphilis of the tertiary type is exemplified by Fig. 36, a case closely resembling the one I recorded some years ago as a fatal case of multiple subcutaneous gummata.¹ The young man was brought into my service at Lebanon Hospital with over a dozen enormous subcutaneous gummata, most of them softened, but still not yet ulcerated. The right knee was the seat of an enormous exulcerated gummatous infiltration, which involved the joint structures. As in the older case, it was practically impossible to keep the open lesion, and the other which subsequently broke down clean, and in spite of all that we could do the patient succumbed to general sepsis.

In these cases I have paid attention to malignant syphilis as expressed chiefly on the cutaneous surface, but it must not be forgotten that malignancy may be shown by the affection of other organs, and the skin may largely or entirely escape. It is the exception, however, for malignancy

¹ Journal of the American Medical Association, December 12, 1896.

to show itself by persistent iridocyclitis, meningeal affections, mucosal ulcerations, etc. The skin is the chief seat of the observable lesions of early syphilis, and there the chief evidences of malignancy are usually found.

The prognosis of malignant syphilis is necessarily uncertain; I can hardly look upon it as favorably as does Hutchinson in the recent edition of his book.¹ Of the four cases mentioned above, two died. As



FIG. 35.—Syphilis maligna. Late secondary frambesiform eruption.
(Gottheil's case.)

regards the ultimate history of those who survive, I am not able to say anything definite. My impression is that patients who have had especially severe or malignant primary or secondary symptoms have had severe tertiary manifestations and sequelæ. Hutchinson is of the opinion that these patients do better later on than the majority of syphilitics, possibly on account of the very thorough treatment that they have usually been

¹ Syphilis, Cassell, 1909.

subjected to. On this latter subject a word may be said. Mercury is the remedy for malignant as for other forms of lues; it must be pushed cautiously, but with determination. These patients especially need it, but unfortunately often stand it badly. Here the injection treatment, and especially that with the insoluble salts, has scored some of its greatest triumphs; apparently hopeless cases, ineffectually treated previously by the mouth or by inunction, sometimes responding marvellously to its effects. A wise eclecticism, however, is more important here than almost anywhere else in the domain of syphilotherapeusis. Soluble injections, insoluble ones, inunctions, oral administration, the mercolint apron, fumigations, mercurial baths, any one may be of use when the others have failed or are not borne. Iodine is required almost always, but in



FIG. 36.—Syphilis maligna. Tertiary form, multiple subcutaneous gummata, gummatous destruction of knee-joint. (Gottheil's case.)

cautious doses and in as non-irritating a form as possible. Besides the ordinary iodides, those of sodium or rubidium, or one of the organic iodides, may be tried; iodypin can be injected; or, finally, and this is a resource that has more than once done me good service, the iodine solution may be administered with milk per rectum, exactly like a nutrient enema. Above all things, however, we must not forget that we have tissues and a general organism to sustain that is reeling under the blow of the virulent and intense microbic invasion; that we have a patient to keep alive as well as an infection to combat. The most careful nursing, diet, and hygiene, the employment of every measure that will help the body cells in their struggle, baths, fresh air, change, tonics—forced feeding—all must be employed, though in some unfortunate cases in vain.

OBSTETRICS.

By EDWARD P. DAVIS, M.D.

PREGNANCY.

The Activity of the Ovary during Pregnancy. In the *Archiv für Gynäkologie*, 1909, Band lxxxvii, Heft 2, Fellner discusses the current belief that during pregnancy the ovaries do not perform their function. For this statement the principal argument is found in the fact that it would theoretically be impossible for the Fallopian tubes to perform their function during pregnancy.

The observations of Ravano and others indicate that ovulation takes place and that Graafian follicles ripen, and that the corpus luteum forms during pregnancy.

Fellner has observed two corpora lutea three times in 13 cases, which are similar to those observed by Ravano. This would indicate that it is possible for conception to occur as early as the fourth day of the puerperal period, so that ripe follicles must have been present in the ovary at the termination of pregnancy.

A considerable number of authors bring forward further evidence of superfetation. The evidence is sufficiently strong that the possibility of this occurrence can certainly not be excluded.

The question may also be raised concerning the secretory function of the ovary during pregnancy. It has certainly been accurately observed that in the first months of pregnancy, at the times when menstruation has usually occurred, bleeding has taken place corresponding closely to menstruation. This observation is familiar to obstetricians.

Fellner mentions a case in a healthy patient under his charge who menstruated regularly to the eighth month of pregnancy. Her confinement was normal, and the child living and healthy. Many seek to explain these cases by the occurrence of some pathological condition favoring passive hemorrhage, such as heart lesions, myomatous tumors, and placenta prævia.

Caruso¹ reports the case of a multiparous woman who menstruated during eleven pregnancies, on each occasion a month later than during the preceding. Thus, in the tenth and eleventh pregnancy, menstruation occurred for nine successive months. He also reports the case of a patient who menstruated each month during twelve pregnancies.

¹ *Annali di Ostetricia*, 1900.

Paoli, Stella, and Schatz, closely observed pregnant women during pregnancy, finding disturbances in the circulation at regular intervals during gestation corresponding to periods of menstruation. It seems to well establish the fact that the secretory function of the ovary is also preserved to a greater or less extent during pregnancy.

Fellner also reviews Schatz's theory that labor occurs at the intervals of circulatory disturbance after a type peculiar to each individual patient. He reports 6 cases with 27 curves in the graphic study of the circulation, showing that circulatory disturbances incident to menstruation occurred during pregnancy as they had done before conception. He could not, in these cases, directly recognize the influence of these disturbances in producing labor. Labor occurred at periods corresponding in each individual to the occurrence of menstruation.

In addition to the circulatory disturbances in pregnancy corresponding to menstrual occurrences, Fellner could recognize a second. This corresponded in duration with the first and original disturbance, but seemed to be of lesser intensity. Both periods were characterized, on the day when blood pressure was highest, by irritation of nerve centres stimulating uterine contractions, or by lessening in the tone of the inhibitory centres. The time of labor usually coincided with one of these periods.

The relation of the activity of the placenta to these disturbances is of interest in connection with the part played by the placenta in producing maternal toxemia. This must be considered as an organ of internal secretion.

The function of the ovary during pregnancy is evidently increased because the cellular tissues of the ovary are greatly hypertrophied. The same is also true of the cells of the lining membrane of the uterus, which greatly increases the uterine secretion during pregnancy. The formation of lutein cells must be recognized as the reaction of the ovary to the increased secretion of the uterus.

From his studies, Fellner estimates the normal duration of pregnancy on the average as $272\frac{1}{2}$ days. Pregnancy terminates seven days earlier than the end of the tenth lunar month. If the normal menstrual periods are estimated at twenty-eight days, the so-called pregnancy periods comprised twenty-one days, and, normally, pregnancy would last for thirteen of these periods or months. The longer the average menstrual period the shorter the number of months during pregnancy.

The Diagnosis of the Complications of Pregnancy and their Prevention. Diesing¹ remarks that it is interesting to observe that the complications of pregnancy occur less frequently among women living in the country than among those inhabiting crowded cities, and that poorer patients have less severe complications of pregnancy than do those living in luxury.

¹ Monatschrift f. Geburtshülfe und Gynäkologie, 1909, Band xxix.

The writer had the opportunity of studying parturition among primitive people during ten years' practice in Africa, in the Malay Archipelago, and the Islands of the South Seas. He saw among these people none of the complications of pregnancy, and not the slightest tendency to vomiting or pernicious nausea. It is not sufficient to say that highly civilized women possess sensitive nervous systems, but the cause must be sought in an essential difference in the constitution of the patient.

He draws attention to the part played by iron in the blood of the nursing mother, and also the presence of sulphur in compounds as a result of the exhaustion of the iron during nursing. He also considers the widespread belief that pregnant women are injured by meat, and their natural craving for vegetables to be an effort to supply vegetable substances rich in iron, and to abstain from meat which is rich in sulphates. The use of meat by pregnant women living in comfort and luxury must be considered one of the great reasons for their frequently complicated pregnancies.

This explanation serves in the pernicious nausea of pregnancy, in which the greater part of the food taken is rejected after it has come in contact with the mucous membrane of the intestine.

The dyspnea of pregnant patients, especially upon exertion, may be explained by the lack of oxygen contained in iron, and the presence of sulphur, a combination which is a good vehicle for carbonic acid. When sulphur and sulphates accumulate in excess in the blood, the percentage of carbonic acid rises, and the pregnant patient suffers from dyspnea.

The gradual exhaustion of iron in the blood of the pregnant woman goes far to explain the occurrence of edema, engorgement of the veins, engorgement of the kidneys, nephritis, chorea, acute yellow atrophy of the liver, and eclampsia.

In prophylaxis and therapy it is important to limit the quantity of proteids in the diet, especially limiting the consumption of meat. The green vegetables containing iron should be freely given, and iron should be artificially administered. If the amount of iron in the body be estimated at 3 grams, and the body loses from 5 to 6 centigrams daily, some idea can be gained of the quantity of iron which should be administered.

Diesing has used with advantage soluble saccharated oxalate of iron with equal parts of phosphate of calcium. In eclampsia, he has seen good results from the intravenous injection of solutions of pigments from the spleen, which are rich in iron. This preparation is termed "splenochrom," and is prepared in liquid form for injection, and also in tablets for administration by the mouth.

Pregnancy Complicated by Acute Icterus. Ballerini¹ reports, from Ferroni's clinic in Parma, 2 cases of acute icterus complicating pregnancy. The first patient had been treated in the clinic for venereal disease, for

¹ *Annali di Ostetricia*, 1909, No. 7.

gonorrheal infection, and for ulceration of the vulva. After a period of greater or less delirium and excitement the patient became comatose, and was admitted to the hospital in that condition.

Upon admission, her temperature was 98°; pulse, 90; arterial pressure, 145 mm. No enlargement of the spleen could be detected, nor was there any abnormality in the heart or lungs. The abdomen was enlarged to correspond with the sixth month of pregnancy.

The urine was scanty, dark in color, giving a light cloud of albumin, and contained bile pigment in moderate quantity. Microscopic examination did not indicate renal lesions.

As the patient did not improve, but showed a tendency to convulsions, the uterus was emptied after dilatation with Bossi's dilator. The patient did not improve after delivery, but died in a few hours.

At autopsy, icterus was acute and very plainly marked in the viscera when the sternum was removed. The lungs were congested; the heart showed no valvular lesions, but the endocardium was congested and the heart muscle degenerated. The intestines were distended with gas, little fluid was in the abdomen, and that was of a greenish tinge, and the spleen was slightly enlarged. The liver seemed to be normal in form, slightly smaller than the average, and the site of fatty degeneration. Hemorrhage and necrosis seemed absent, but the liver was greenish yellow in color throughout its tissues. The bile was fluid and dark brown. The kidneys were congested, and there were numerous hemorrhages throughout the substance, but fatty degeneration was absent. The pancreas was normal, as were the uterus and bladder. Beyond the distention of the intestine no essentially abnormal condition was present. There was nothing about the uterus which threw any light upon the case.

The second case was that of a married woman, also admitted in coma. Her history stated that she had been in a generally depressed condition for some time, with nausea, prostration, and indefinite pains in the abdomen and back. She gradually became stupid, and finally comatose. There had been hemorrhage from the genital organs.

Upon admission, her temperature was 97.5°; pulse, 100; blood tension, 115 mm. The pupils reacted to light; respiration was frequent; the heart and lungs were apparently normal; the abdomen was slightly distended, with resonance in the iliac fossæ. The lower border of the liver could be made out distinctly at the border of the ribs. The spleen and kidneys seemed to be normal. The fundus of the uterus could be felt at the upper border of the pubis. The urine was bile-stained, its quantity much diminished, and its reaction acid. It contained neither albumin nor sugar, but bile pigment in abundance.

The microscopic examination showed some granular cylindroids, white and red blood cells, and cells from the bladder.

The patient did not improve, but had convulsive movements, and also hemorrhages from the nasal mucous membrane and from the gums.

The urine was voided involuntarily. The patient was exceedingly restless. This condition continued until death.

At autopsy, the blood was remarkably fluid and dark, the mucous membrane of the respiratory passages was intensely congested, the intestines distended, the substance of the liver slightly decreased in volume, but apparently without fatty degeneration. The spleen seemed normal. The kidneys had multiple small hemorrhages throughout their substance. The uterus contained a dark blood clot. The meninges were intensely congested, and the sinuses distended with fluid blood.

Upon microscopic examination of the liver, the structure was found greatly altered. Necrobiosis was markedly present in the cells, the nuclei were discolored, fatty degeneration of the cells was present, and the protoplasm of the cell granular. The leukocytes had migrated into the liver substance in great abundance. The pigment granules had also been widely deposited. The kidneys showed granular degeneration of protoplasm; no traces of microorganisms were found in the liver or kidneys. Bacteriological examination of the blood and its serum was also without result.

While an essential toxemia must be recognized as the cause of the condition present in these cases, no definite conclusion is reached regarding the origin of this condition.

Anchylostomiasis in Pregnancy. Sacchi¹ contributes a paper upon this subject, in which he tabulates 38 cases. In examining this record, the ages of the patients varied from eighteen to forty-four years. There seemed to be no difference as regards primiparity or multiparity. A very pronounced anemia was present in most cases, albuminous and scanty urine, and deficient fecal excretion. The percentage of hemoglobin was greatly lessened, in some cases reaching as low as 30. The fetal mortality was considerable from stillbirth, or hemorrhage after birth.

The writer concludes that this disease is not uncommon in his vicinity, and that its principal lesion is colpitis, and that the interruption of pregnancy occurs in 28.94 per cent. The maternal mortality is considerable, and its principal effect upon the mother seems to be the interruption of gestation.

Pyelonephritis in Pregnancy. Weindoer² believes that the most frequent cause of pyelonephritis in pregnancy is to be found in catarrhal inflammation of the bladder. In these cases, bacteria remain latent and are readily roused to activity, passing upward along the ureters.

He believes that cases of pregnancy complicated by obscure fever should be subjected to the careful use of the catheter and a thorough examination of the urine. It is of special importance that in all cases where there is retention of urine during pregnancy, and where catarrh

¹ *Annali di Ostetricia*, 1909, No. 7.

² *Zentralblatt f. Gynäkologie*, 1909, No. 37.

of the bladder has developed, that this catarrh should receive prompt and efficient treatment. In the presence of a thoroughly established pyelonephritis, expectant treatment only should be employed. Very rarely, if ever, should the interruption of pregnancy be considered.

Kakke Complicating Pregnancy in Parturition. Ogata¹ describes kakke as a subacute or chronic miasmatic infection, producing inflammation of the peripheral nerves and muscles, and characterized by greater or less disturbance in motility, sensibility, circulation, and secretion.

The etiology of this disease is not clearly made out, but in Japan kakke is a frequent complication of pregnancy and parturition, and a very dangerous one. It often complicates tuberculosis, and occurs frequently in the rainy season in the early autumn.

Those who describe it divide the cases into three forms: The *dry form*, the *edematous*, and the *cardiac* or *acutely pernicious form*.

Of these, the first and second are chronic or subacute. It is as yet not known which variety occurs most often in pregnancy. It is usually thought that the acute or pernicious, and the edematous are more common in pregnant and parturient women than the dry form. When the patient contracts the disease in pregnancy it is not so severe in the puerperal condition. Ogata found that kakke occurring primarily in the puerperal period is highly virulent.

The *dry* or *atrophic variety* of kakke complicating pregnancy shows itself first by unsteadiness in the movements of the legs, weakness of the knees, hyperesthesia or modified sensation in the anterior surface of the legs, the tips of the fingers, and about the mouth. In all cases slight edema developed on the anterior surface of the tibiæ. The muscles about the jaws and the supinator longus muscle are sensitive to pressure. The patellar reflex is at first increased, and afterward disappears.

The patient complains of palpitation of the heart and a sensation of smothering upon the slightest exertion. At first the appetite is not disturbed, but later increased. Cardiac dulness is increased upon the right side, the heart sounds are muffled, murmurs are often present, the first pulmonary sound is obscured, while the second pulmonary sound is greatly accentuated. The arm reflexes are not increased; there is no fever, but the pulse is more or less quickened, and responds easily to irritation. After exertion, the frequency of the pulse is greatly increased; the height of the pulse wave being great, but the pulse being soft and compressible, with a tendency to become running. At times a dicrotic pulse is observed.

In most cases, the arterial tension is greatly lessened, as in febrile diseases. In severe cases, a pulse resembling that of aortic insufficiency is present. The blood shows no characteristic alteration.

The quantity of urine passed daily is very small. In mild cases, the

¹ Monatsschrift f. Geburtshülfe und Gynäkologie, 1909, Band xxix, Heft 1.

secretion of urine remains unaltered. Its specific gravity varies from 1025 to 1035; it is strongly acid, and the nitrogenous excretion is greatly diminished, in severe cases dropping to 8 grams. Indican is often present in the urine, especially in severe cases where there is obstinate constipation and where purgative medicines have little effect. Occasionally there is paralysis of the bladder and bowels; in severe cases the bowels move involuntarily.

Hyperesthesia of the skin, in a greater or less extent, is a constant symptom of atrophic kakke in pregnant patients. This does not follow the distribution of nerve fibers. It is first observed on the inner aspect of the leg and foot, gradually extending over the whole foot and upper thigh as the disturbance of sensation increases at the site of the first lesion. This disturbance further extends over the arms, the tips of the fingers, then in the region of the mouth, and muscles of the mouth, varying in intensity from above downward. In the limbs, the disturbance of sensation is stronger on the extensor than on the flexor side. Strong faradic currents are not felt on the abdomen, the lower portions of the thighs and on the fingers. Throughout the whole body the reaction of the faradic current is greatly lessened. Hypesthesia is rarely observed. Hyperesthesia is often present, and in various forms.

Pregnant and parturient women suffering from kakke constantly complain of lassitude in the lower limbs, a feeling of contusion about the feet and in the calves, and often a sensation of twitching throughout the limbs. Definite pain is comparatively rare. In very rare cases sticking, grasping, or cutting pains are felt in the arms and limbs. The knee-joints are often painful, and there is great sensibility in the muscles of the upper thigh and upper arms.

In atrophic kakke complicating pregnancy there are especially pronounced disturbances. At the end of pregnancy the symptoms often completely disappear. In the majority of cases, however, the illness persists throughout the puerperal period. In some cases, well-marked atrophy occurs in the muscles of the legs and about the ankles. During labor uterine contractions are feeble, labor is prolonged, and the child is born asphyxiated or dead. After the birth of the child the womb contracts poorly, and pronounced hemorrhage is frequent. The third stage of labor is prolonged, and after the expulsion of the placenta the uterus fails to contract, so that postpartum hemorrhage threatens. During the puerperal period involution is poorly performed. There is often retention and decomposition of lochia.

These patients suffer from fever in the puerperal period, and often puerperal septic infection develops. The symptoms of kakke become greatly aggravated and the course of the disease is much prolonged by the coincidence of pregnancy, although in rare cases recovery follows. Relapses are frequent. When kakke first appears in the puerperal

period it is especially severe. The course of the disease is rapid, and muscular atrophy is very pronounced. Recovery is greatly prolonged.

In the *edematous form of kakke*, pregnant patients complain especially of weakness in the limbs. Paralysis of a high degree develops, so that after a time patients are unable to walk. Edema first appears in the lower portions of the thighs and spreads rapidly over the entire body. Dropsy also develops in the serous cavities of the body. The patients complain of disturbed action of the heart, a feeling of cardiac distress, pain in the region of the stomach, with lessened secretion of urine. These symptoms often persist for long periods. If the secretion of urine be increased, the symptoms abate somewhat and the general condition of the patient improves. If the edema disappears, the emaciation and paralysis in the limbs seems unaltered. The paralysis persists for a long time, but the power of motion is very gradually recovered.

In the *acute pernicious form of kakke*, the first symptoms are those of cardiac insufficiency. Women who have previously been perfectly healthy may be suddenly taken by this condition. Sometimes the severe form develops suddenly in the course of a mild attack, beginning with palpitation of the heart, a sensation of pressure, and dyspnea. The appetite soon grows much less and the patient complains of severe thirst. The secretion of urine is much diminished. The edema does not become especially pronounced, but palpitation of the heart and dyspnea rapidly become worse. The patient complains that she feels as if the chest were in a vice, and she becomes very restless. Vomiting and disturbance of the stomach are present. The eyes, the mouth, and the nostrils are widely dilated. The look of the patient is staring, and the pupils are widely dilated. In the region of the heart distinct undulation can be detected. The pulse grows continually smaller and weaker, and finally is running and thready. The face becomes cyanotic, and the extremities gradually cold. The temperature sinks, unconsciousness develops, and death ensues.

The writer reports in detail 4 cases among whom occurred several interesting autopsies.

The *differential diagnosis* must be made between nephritis complicating pregnancy, tabes dorsalis, myelitis, lateral sclerosis, muscular atrophy, and lepra.

So far as the *treatment* is concerned, a highly nutritious diet and absolute rest are of the greatest importance. When milk can be taken, it is especially valuable. In the early stages of the disease, saline laxatives are indicated. Occasionally, in the edematous form, very active purgatives are used to advantage, as one drop of croton oil. Digitalis in the puerperal period is useful. Diuretin gives good results in cases where digitalis and strophanthus are not well borne. Where the heart is extensively involved, spartein and caffein answer well as stimuli. In the edematous cases their action is especially good. Hypodermoclysis

in severe cases is valuable. Faradization of the phrenic nerve is valuable in cases where there is a tendency to hemorrhage. In all cases the regulation of the diet and the correction of constipation are especially important. Diuretics seem to have little influence in the early stages; in the later stages they are of value. In severe edematous forms, the patient must be put at absolute rest and upon a strictly milk diet.

When symptoms of cardiac failure show themselves, if the condition justifies operation, the uterus should be emptied as soon as possible. In cases where the pulse is not sufficiently strong to justify operation, dry cups are applied over the chest with galvanization of the phrenic nerve, and a subcutaneous injection of salt solution. If improvement follows, induced labor should be performed. After this, the patient should be kept at absolute rest on a purely milk diet, and with a 20 per cent. injection of caffein by the hypodermic method. In the acute pernicious cases, the induction of labor is of no value, but makes the patient much worse. When the paralysis is widespread, it is useful to treat the paralyzed muscles with electricity and massage, combined with the use of warm baths.

In the atrophic form, the injections of strychnine solution in increasing doses may be employed. If the disease becomes chronic, and convalescence is delayed, tonics and alteratives are indicated.

Eighty per cent. of the cases belong to the edematous form of the disease. In rare cases, after the edema disappears, atrophy of the muscles is found. Very mild cases complicating pregnancy are often overlooked. In the atrophic form, uterine contractions are greatly weakened, and labor is prolonged. The uterus contracts poorly after the expulsion of the child and postpartum hemorrhage is often severe. Very severe hemorrhage may develop during the delivery of the placenta. During the puerperal period the uterus contracts imperfectly. The lochia is often foul, and the patients during the puerperal period frequently have fever. Septic infection is common.

In the edematous cases pregnancy is often interrupted. Many ova perish in the uterus or die soon after labor. In most cases the children born living do not long survive, although in exceptional circumstances a woman suffering from kakke may give birth to a healthy child. When the edematous form develops during pregnancy, if the patient can be brought to the puerperal period, there is often rapid improvement under very conservative treatment.

The prognosis is worst for the edematous form, which develops during the puerperal period. Most of these patients die, or if they survive, suffer from edema, muscular atrophy, and motor paralysis.

An autopsy upon two children who had died of kakke four days before examination showed hypertrophy and dilatation of the right ventricles, with a remarkably fluid condition of the blood.

It is thought that the kakke poison passes through the placenta from mother to fetus.

Syphilis of the Kidney Complicating Pregnancy.—Hirsch,¹ of Berlin, reports the case of a patient, aged thirty years, who was in her fifth pregnancy. The other pregnancies had been complicated by failure of labor pains, nephritis, and edema, and hydrocephalus in the child. The patient had been treated for the nephritis of pregnancy, but had polyhydramnios when she came into labor, with a dead and hydrocephalic child. The child had ascites, enlarged spleen, with fibrous tissue in the capsule, enlarged thymus and liver. The urine showed abundant epithelia, but no cylindroids and no leukocytes. After the birth of the child, the patient became worse, the right kidney was evidently enlarged in all directions, and the surface of the kidney could be felt not to be smooth and flat. Palpation was painful. The left kidney could not be felt; the left lumbar and iliac regions were not painful.

The urine voided in twenty-four hours was 300 c.c. It contained 3 per cent. of albumin, and in the sediment only a few kidney epithelia in good condition. The patient's general condition was bad. There was leukoderma over the upper portion of the trunk, especially in the region of the breast. The axillary and adjacent glands were enlarged; there was excessive caries of the teeth, thickening in the upper portion of the lips, exostoses on the right tibia, and edema over both shins.

When the patient was questioned closely, she asserted that for several years she had felt weak and depressed. Although there had been a good appetite she had not gained in weight, but, on the contrary, for the last year had lost. The pains in the region of the right kidney were frequent and annoying. The feet often swelled, and albumin was frequently found in the urine.

During the pregnancy in which she was seen, these symptoms all increased in severity.

A study of the case enabled the writer to exclude chronic nephritis. Malignant disease of the kidney did not seem probable. There remained a chronic inflammation or infection, tuberculosis or syphilis. Before proceeding to operation, a therapeutic test was made with iodide of potassium.

So far as the examination of the body of the child was concerned, no positive evidence of syphilis was found, although, unfortunately, no examination was made for the *Spirochæta pallida*. This organism should also be found in the fetal end of the umbilical cord, and frequently in the tissue surrounding the umbilical vein.

Under the free use of potassium iodide, the patient gained in weight, and greatly improved in general condition.

He reports a second case of a patient, thirty-five years old, whose

¹ Zentralblatt f. Gynäkologie, 1909, No. 35.

former pregnancy had been interrupted at five months by edema and albuminuria. There was also pain in the region of the right kidney.

Upon examination, a right-sided painful kidney tumor could be felt, with anasarca, lessened secretion of urine, and a considerable percentage of albumin without kidney débris. The patient showed symptoms of syphilis. She improved very considerably under treatment with iodide of potassium.

Pyelitis in Pregnancy.—Sondern¹ gives his opinions regarding pyelitis, based upon 18 cases, in all of which the colon bacillus was demonstrated in the urine. In all of these cases there was some condition present in which it would be reasonable to expect undue virulence in the colon bacillus, such as abundant colon bacillus present, while the microscope would reveal structures referable to the pelvis of the kidney and parenchyma. A mild septic process was also present. There was no reason to believe that the involvement of the bladder existed prior to the renal pelvic lesion in the seven cases not observed until the development of the pyelitis. But, on the other hand, its existence could not be excluded.

During the acute stage of the pyelitis, the blood showed a leukocytosis averaging 16,000, and a relative polynuclear increase of 86 per cent. When the acute stage of the pyelitis has subsided, usually at the end of a week, the urine increases in quantity, its specific gravity is lower, the color is pale, the odor offensive, the urea 14 to 20 grams daily, the albumin still in excess, with the colon bacillus, and a few hyaline casts.

It is in this stage that specimens of urine are usually sent for examination. The differential diagnosis between this condition and tuberculosis or gonorrheal pyelitis can generally be made from the character of the bacilli present.

While this condition usually improves, it does not entirely clear up until the end of pregnancy. Acute exacerbations may occur, especially during the puerperal period; less often afterward.

In 4 cases, acute suppurative nephritis developed, and operative interference was demanded. One was in the fifth month of pregnancy, one in the eighth month, one five days postpartum, and one several months postpartum. The symptoms were those of the acute onset, with increased severity. The blood examination in 2 cases showed leukocytosis of 25,000 and 40,000.

The gross appearance of the kidney showed little if any increase in size. The color was dark, with intensely hyperemic areas, and the surface studded with miliary abscesses. The microscope showed abscesses in the cortex and boundary zone, with purulent infiltration extending irregularly. The epithelia of the capsules and tubes was degenerated, and most of the tubules contained pus and debris. Suppuration was most recent outside the small bloodvessels; there was no increase of

¹ Bulletin of the Lying-in Hospital of the City of New York, 1909, No. 1.

connective tissue, and cultures showed a profuse growth of streptococci with the colon bacillus. No evidence of tuberculosis was found.

The infection, both in the colon bacillus and streptococcus, seemed to be an ascending one rather than a hematogenic one.

In studying these cases, the history of any intense disorder in a pregnant woman which would justify a suspicion of undue virulence of the colon bacillus or its presence in excessive numbers requires prompt treatment to avoid infection of the urinary tract, and the possible toxemia of pregnancy. If a colon bacillus cystitis has developed, it should receive active attention because an ascending infection may attack the kidneys.

The *treatment* should be directed locally, or to the condition of the blood, as the conditions indicate. Pyelitis may be diagnosticated by clinical symptoms and the study of the urine. Acute exacerbations do not present a perfectly clear picture, and the blood condition is that of inflammation. A thorough examination of the urine is the best guide. The possible occurrence of acute suppurative nephritis must not be forgotten, and symptoms pointing to suppuration must not be ascribed to lesions in the uterus, tubes, or ovaries when the actual condition is in the pelvis of the kidney.

Indications and Prognosis of Operations for Gallstone Complicating Pregnancy. Roith¹ reviews the question of gallstone operations complicating pregnancy, collecting the reports of a number of cases in the literature of the subject.

In all, he has collected 9 cases, with a mortality of 1 per cent. Abortion occurred in one case, and labor fourteen hours after operation in another.

The study shows that pregnancy affords no special contra-indication for operation upon the gall ducts or gall-bladder. A waiting policy with these cases is more dangerous than in the non-pregnant. The prognosis, so far as life is concerned, is no worse than in non-pregnant patients.

So far as the continuation of pregnancy goes, it depends considerably upon the period of gestation, the intensity of the jaundice and infection, and upon the severity and duration of the operation. Before the middle of pregnancy, the danger of abortion is not great. Toward the end of pregnancy, the danger of interruption of labor increases. At this time an oblique incision parallel to the borders of the ribs, and cystotomy, seems a better method of operation than any other, for the operation is thus made shorter, and the uterus is disturbed as little as possible. If, however, the interruption of pregnancy was not especially feared, any other convenient incision might be chosen. In severe cases, at the end of gestation, the delivery of the patient before the operation must be considered, and here vaginal Cesarean section has something in its favor, inasmuch as it does not require uterine contractions for its

¹ Monatsschrift f. Geburtshülfe und Gynäkologie, 1909, Band xxix, Heft 4.

performance, and the uterine wound is not in the vicinity of the infected hepatic area. Should uterine contractions begin after the operation, and they do not cease, rapid dilatation and delivery are indicated, because the continuation of the pains of labor increases the absorption of infectious material in the area of operation. The anesthesia in these cases requires especial skill and attention.

Volvulus of the Sigmoid Flexure during Pregnancy. Lampe¹ describes the case of a patient in the sixth month of pregnancy, who, after lifting a heavy tub filled with water, had sudden and severe pain in the abdomen. She could not stand, and speedily became faint and unconscious. Vomiting was absent, but fecal matter and gas were quickly expelled, followed by increasing distention of the abdomen.

On the afternoon of the second day, vomiting began and was repeated upon the third day. On the morning of the fourth day the patient had great tympany in the upper abdomen, especially on the left side. The uterus occupied the median line, not deflected toward the right, by the sigmoid flexure upon the left. From this fact it was inferred that the pedicle of the flexure had been carried backward into the abdominal cavity.

Operation was performed, with a free incision in the middle line, by seeking the pedicle of the volvulus and freeing it as thoroughly as possible. To replace the intestines, it is well to puncture the distended bowel with a trocar, thus allowing the gases to escape. In closing the abdomen it is necessary to bring the wall of the sigmoid flexure from the parietal peritoneum with several stitches. If gangrene of the bowel is present, the pedicle in the flexure should be left in the abdominal wound, the gangrenous portion removed, and an artificial anus made. If the gangrene extends deeply along the rectum into the small pelvis, the descending colon should be stitched into the wound and gauze packed about to prevent infection. If the condition of the patient be critical, local anesthesia should be employed rather than general anesthesia. Lampe's patient recovered after operation, but of 6 cases operated upon by various surgeons, 4 died.

Appendicitis Complicating Pregnancy. Findley² reports 7 cases of appendicitis complicating pregnancy. One was in the third month of gestation, and had suffered from pernicious nausea for three weeks, and was unable to retain nourishment. As the patient's condition was critical, a thickened adherent appendix was removed, and the uterus was emptied. Death followed from exhaustion and bronchopneumonia.

The second case was one of appendicitis complicated by abortion, followed by general peritonitis. Although drainage was instituted, death followed.

¹ Monatsschrift f. Geburtshilfe und Gynäkologie, 1909, Band xxix, Heft 4.

² American Journal of Obstetrics, December, 1909.

The third case was in the fifth month of gestation; she had lost blood from the uterus, and great pain in the region of the appendix, without fever. The uterus was emptied, and subsequently the appendix was removed. The patient recovered.

In the fourth case, a fluctuating mass the size of a large orange, was found in the right iliac region. This abscess was opened and drained through the abdomen, and three days later a blighted ovum was expelled from the uterus. The patient recovered.

In the fifth case, appendicitis developed three days after labor, and ran a protracted course. Six weeks later the appendix was removed, the tip being found adherent to the uterus. Recovery followed.

In the sixth case severe pain had occurred in the region of the appendix after three successive labors. When near full term these pains again developed, and were thought to be labor pains. Within two days, the patient was in a dying condition from general peritonitis. Autopsy showed a gangrenous appendix, with suppurative peritonitis, and the death of the child within the uterus.

In the last case quoted, intense pain developed over the appendix during labor, and, two days after a normal delivery, the temperature rose to 101° F., with pain and muscular rigidity, these subsiding within three days.

This patient was advised to have the appendix removed as soon as she recovered from the puerperal period. This and other similar cases emphasize the importance of removing the appendix in all pregnant patients as soon as symptoms of infection of the appendix occur. In old cases of appendicitis, labor is especially dangerous, as uterine contractions may rupture an abscess, causing the escape of pus and general peritoneal infection.

Diverticulitis Complicating Pregnancy; Resection of the Sigmoid; Recovery. Ross¹ reports the case of a patient who had been delivered of a living child one month previous to admission to the hospital. Upon getting up after labor, she had pain in the abdomen, with symptoms of developing infection.

Upon examination, a mass was felt at the left side of the uterus, whose nature could not be definitely made out. As the fever continued, the abdomen was opened in the median line, the patient placed in the Trendelenburg posture, and the intestines carefully packed back. A mass was found adherent to the rectum high up at the sigmoid flexure. This was gradually peeled off, and the parts isolated, when it was found that the ovaries and tubes on both sides were healthy. It was then observed that the chief portion of the swelling was outside the peritoneum, and that as the rectum was separated from it there was evidently a direct communication between the mass and the interior of the rectum.

¹ American Journal of Obstetrics, April, 1909.

That portion of the sigmoid which was perforated seemed also to contain a newgrowth.

It was thought best to resect the intestine, and about ten inches of bowel were removed. End-to-end closure was completed by direct suture. Iodoform gauze packing was placed over the mass in the neighborhood of the round ligament.

Although the patient's condition at the end of the operation was very dangerous, she rallied, and finally recovered.

Upon examining the specimen, it was found to be a diverticulum. The mucous membrane of the intestine had been perforated through the formation of an ulcer, and infection had spread up and down between the intestinal coats, which had finally given way, and the infection had further spread along the round ligaments.

A Clinical Contribution to the History of Appendicitis in Pregnancy. Stähler¹ reports 3 cases of appendicitis complicating pregnancy.

The first was that of a woman in her second pregnancy who had frequent attacks of abdominal pain in the right lower portion. At about sixth months, she was suddenly taken with a chill and pain in the abdomen, which a midwife thought was painful uterine contraction.

Upon examination, the diagnosis of appendicitis could not be positively made, but the patient suffered from very decided pain. Gradually, typical symptoms developed. Upon operation, incision revealed purulent and turbulent fluid. The appendix was much enlarged and adherent, but was readily separated. The right Fallopian tube was in a state of acute and active inflammation. Both were removed, and the abdomen was closed with drainage.

Examination showed necrosis of the appendix with infiltration of the mesentery surrounding it.

Ten hours after operation the patient spontaneously expelled a dead fetus, after which she made a good recovery.

The second case was that of a woman who had considerable pain in the right lower portion of the abdomen, at intervals, for a year. Menstruation had been absent for three months, during which time the pain had become more frequent, accompanied by considerable difficulty in the movements of the bowels.

Upon examination, there was tenderness and rigidity over the region of the appendix, with normal pulse and temperature. In view of the patient's condition, operation was immediately undertaken, and the appendix removed without difficulty. It was lightly adherent to the surrounding tissues. Pregnancy was uninterrupted, the patient going to full term, and having a normal labor.

Upon examining the appendix it was found moderately enlarged and slightly adherent. The lumen of the appendix was much lessened,

¹ Zentralblatt f. Gynäkologie, 1909, No. 50,

and four small oxalate calculi were found in the centre of the appendix. Beneath the mucous membrane was an area of necrotic tissue. The mucous layer and muscular layer were considerably infiltrated and thickened. In some portions, the lumen of the appendix was obliterated.

The third patient was one at the fourth month of pregnancy, with pain and distress over the appendix. Rest in bed and other measures were tried for the relief of these symptoms, when the patient became suddenly and very considerably worse, with increased pain and disturbance of the pulse. At operation, the appendix was displaced upward and outward, lying between the cecum and the iliopsoas muscle. It was adherent to both. Although no perforation had occurred, there was local peritonitis.

Upon examination, the lumen was considerably lessened, and a fecal concretion was present. The wound was drained and the patient recovered without accident, pregnancy terminating normally.

Stähler calls attention to another case of appendicitis occurring in early pregnancy where operation was positively declined. The second attack proved fatal.

Another patient was admitted to the hospital at eight months' pregnancy, with symptoms of appendicitis. A closer study of the case revealed pyelitis upon the right side as the condition present.

Myoma and Pregnancy. Smyley¹ considers this subject from two aspects: The effect of pregnancy upon myomata, and the effect of myomata upon pregnancy, labor, and the puerperal condition.

When pregnancy occurs in a myomatous uterus, the tumors rise out of the pelvis with the uterus to a greater or less extent. Cervical tumors, or those growing into the cellular tissues at the sides of the uterus, maintain their position or are driven downward during labor. These are the most dangerous during parturition. Myomatous tumors become larger and softer as the uterus grows. This happens not only from the development of their tissues but from edema, which sometimes becomes excessive. Such tumors lose their globular shape, being flattened as the uterus expands, and it is sometimes difficult to recognize and distinguish them from the surrounding tissue. During pregnancy, necrosis is not common unless the pedicle of such a tumor twists. During the puerperal period, necrosis often occurs and may be followed by sloughing and septic infection. In many cases, myomata undergo absorption during involution of the uterus.

During pregnancy, myomata rarely cause serious complications. Occasionally hemorrhage, abortion, placenta prævia, ectopic gestation, intestinal obstruction, ischuria, obstruction of the ureter with hydro-nephrosis, twisting of the pedicle with peritonitis, retroversion and impaction of the uterus, and pressure upon surrounding viscera, may all be traced to myomatous tumors.

¹ British Medical Journal, January 23, 1909.

Diagnosis during pregnancy is often difficult, and the myomatous uterus is not infrequently removed when pregnancy is unsuspected. Hemorrhage is so frequent in pregnancy complicated by myomata that rapid growth in a myomatous uterus with hemorrhage should excite the suspicion of pregnancy. It may be difficult to detect the anatomical signs of early pregnancy in a myomatous uterus.

In labor, myomata of the uterine body seldom cause complications, are often overlooked, and sometimes mistaken for fetal parts. They often cause inertia, and when in the lower portion of the womb may obstruct dilatation and gradually prolong labor. Usually the tumor is drawn up past the fetus, or pushed down and flattened by the presenting part. Labor may become impossible when large tumors are adherent behind the womb or develop in the subserous tissue. Such tumors disturb the mechanism of labor, deforming the uterine cavity, and preventing the presenting part from entering the brim of the pelvis. Placenta prævia is very common in myomatous uteri, as the mucous membrane of the womb is so altered by the tumor that the ovum is often abnormally implanted.

Myomata more often cause complications in the third stage than in the other stages of labor. The uterus contracts poorly, and the placenta is often retained with hemorrhage. When the placenta is implanted upon the tumor, the mucous membrane covering the submucous tumor is often so thin that the ovum grows through the decidua and attaches itself to the tumor, from which it may be impossible to separate the placenta. Fatal hemorrhage has occurred in these cases, and it has been necessary to terminate labor by the extirpation of the uterus. The attachment of a tumor to the fundus of the uterus has produced inversion.

Dangerous postpartum hemorrhage is a frequent complication in myomatous cases. Such may occur at any time within a number of days after labor. Septic complications are not rare in these cases.

Regarding *treatment*, the induction of labor should not be practised in myomatous uteri. At term and during labor, tumors not obstructing the birth canal or disturbing labor, require no attention. Polypi and cervical tumors should be enucleated. When the tumor is so large that it obstructs delivery, no effort should be made to drag the fetus past the tumor. If the fetus does not make its way into the pelvis in a reasonable time, delivery by Cesarean section is indicated. The tumor may then be enucleated or the uterus removed, in accordance with the circumstances of the case. As the uterus is often septic, its extirpation is indicated. Tumors causing obstruction are so low in the pelvis that it is difficult to form a uterine stump.

Smyley reports the case of a primipara with delayed labor, the fetus lying obliquely. A tumor as large as the fist was found to the left of the cervix, which could not be pushed above the pelvic brim. The child

was delivered stillborn by version, and the mother's puerperal period was complicated by hemorrhage and fever, from which she gradually recovered.

Adenomyoma of the Uterus. Bland-Sutton¹ describes the case of an unmarried woman, aged forty-three years, who suffered from obstinate menorrhagia, the fibroid uterus completely filling the pelvis.

At operation, the tumor had a peculiar vivid redness, and a number of short, ragged, villous tufts at the summit of the tumor. Upon making section, the tumor was found to be an adenomyoma of a very diffuse character. It was full of terminal buds from the endometrium, which had made their way through the muscular wall of the uterus and blossomed under its serous capsule. Around the cornua these bodies became pedunculated.

Several observers have found that inflammatory conditions of the Fallopian tubes often accompany adenomyoma of the uterus. Cases are recorded in which a tuberculous infection had been grafted upon the adenomyoma. This condition does not make pregnancy impossible, although a smaller number of these women become pregnant than among those in whom the condition is not present. The clinical symptoms are a sanguineous discharge from the vagina, often for five or six weeks without intermission, and pain at the menstrual period.

It is difficult to make a positive diagnosis before operation, as an exact diagnosis can only be made by the use of the microscope.

The only effectual way of dealing with the disease consists in the removal of the uterus. The cervix may be retained, if desired, and one ovary should also be reserved. Drugs are useless in these cases, and ergot has no effect upon the disease.

The Pyelitis of Pregnancy Treated by Coli Vaccine. Hicks² describes the case of a patient five months advanced in her second pregnancy, who had typical symptoms of pyelitis in the right kidney. The patient grew worse, with increasing fever and rapid pulse. Upon examination, the *Bacillus coli communis* was obtained from the urine, and a vaccine prepared from a pure culture.

After four days' rest in bed, the temperature and pain not abating, 10 c.c. of the coli vaccine was injected. The temperature became almost immediately normal, and so remained, except for a slight elevation two days later. The symptoms abated, but the pyuria persisted intermittently. The patient was apparently well a month and a half later.

She returned to the hospital subsequently for a slight attack of her former pain. A healthy child was normally born at full term. Four days after delivery the urine contained no pus, the patient making a good recovery.

During pyelitis complicating pregnancy, the patient should be kept

¹ British Medical Journal, January 23, 1909.

² Ibid.

warm, taking only very gentle exercise, and living chiefly upon milk and farinaceous foods. Alcohol should be forbidden. Mild saline water should be used freely, and the patient should take plenty of rest, preferably in the sunshine. Should pyuria persist after labor, damage to the structure of the kidney must be inferred. As a rule, the condition rapidly clears up after labor.

Red Degeneration of Uterine Fibroids Complicating Pregnancy. Bland-Sutton¹ calls attention to the overlapping of the childbearing period and the fibroid growing period in women.

Pregnancy causes a very marked alteration in the normal development of the uterine wall when fibroid tumors are present. In the tumors themselves, a degeneration called "red degeneration" is peculiarly likely to occur during pregnancy. This is accompanied by pain and tenderness as clinical symptoms. While in the non-pregnant patient the ordinary hard fibroid on section is dirty white or pale yellow, during pregnancy these tumors become a deep red or mahogany color. Early in pregnancy the color is in streaks, but later on the whole fibroid softens. During the puerperal period such a tumor may rupture its capsule and the red softened tissue be discharged from the uterus in shreds. This may be mistaken for a retained placenta or membranes. Micro-organisms are not found in this material, although it has the peculiar odor of stale or putrid fish.

Upon microscopic examination, the tissues are necrotic and do not stain. The redness is caused by the diffusion of blood pigment.

In some cases, this red degeneration proceeds very rapidly, producing severe pain. In two such specimens Smith and Shaw isolated micro-organisms. In one, staphylococci were in the bloodvessels; in another, diplococci were in the spaces around the vessels. Thrombosis of the bloodvessels was the principal lesion present. Such tumors are especially liable to become infected.

Sutton describes the case of a primipara, aged thirty-one years, two months pregnant, suddenly taken with acute abdominal pain during a railway journey, which obliged her to leave the train and seek medical care.

A diagnosis of ruptured ectopic pregnancy was made by the physician who first saw her. Sutton found an abdominal tumor occupying the right half of the abdomen and reaching to the liver. It was thought that this might be an ovarian cyst with twisted pedicle. There was great tenderness, with a pulse of 112 and a temperature of 100° F.

Upon opening the abdomen, the tumor was found to be a large subserous fibroid with a thick pedicle. The uterus was pregnant, containing several small fibroids.

Upon examining the specimen, a patch of red softening, one-third

¹ British Medical Journal, June 19, 1909.

the bulk of the tumor, was found. A pure culture of *Staphylococcus pyogenes aureus* was obtained.

Pain and tenderness are only present in these cases in the early stages of necrosis. When the tumor becomes completely changed they are insensitive. Pus tumors may become so soft that after labor the finger could readily be pushed into and through the tumor. Profuse hemorrhage often occurs, which is very dangerous to the patient. If the uterus contains several such tumors, but part of them may become degenerate.

The pain is remarkable because it develops so suddenly, resembling the pain of an ovarian tumor with twisted pedicle, or the pain and shock of rupture of a tubal pregnancy. The symptoms are those of the two conditions just mentioned, and an erroneous diagnosis is not uncommon. If the patient be placed in bed as soon as the pain develops, the symptoms often subside.

Ovarian fibroids are also liable to soften, liquefy, and calcify. These tumors occasionally complicate pregnancy and may become incarcerated in the pelvis with a gravid uterus.

These ovarian fibroids do not, so far as is known, undergo red degeneration.

A table of 20 cases is added, showing that the age of these patients is almost invariably above thirty years, and that degeneration occurs in early pregnancy.

Myoma and Sterility.—Martin¹ does not believe that the old view that myomata make pregnancy almost impossible can be at present accepted. In myomatous cases the ovaries are often hyperplastic, and many of these patients who marry late in life become pregnant.

Myomata and Labor. Schauta² found, in 110,000 cases of pregnancy, 86 complicated by myomatous tumors of the uterus. This was most frequent in primiparæ above the average age. In 60 per cent., labor proceeded spontaneously, although often prolonged. Placenta prævia and adherent placenta were frequent complications.

When the myomatous tumor is above the contraction ring, interference may not be necessary. If the tumor is below in the pelvis, an effort should be made to push it above the pelvic brim. The danger of bruising a tumor, necrosis, and embolism, make efforts at replacement dangerous; so also is the attempt to deliver the child forcibly through the vagina. Cesarean section is the preferable operation, and the method may be chosen in accordance with the conditions present.

Myoma of the Uterus in the Puerperal Period. Engstrom³ has found that myomatous tumors of the uterus after labor usually become much smaller in size. Necrosis may develop, especially in intramural tumors, and may thus prevent proper involution. Small submucous tumors may be spontaneously expelled in the puerperal period. Should an intramural

¹ *Monatsschrift f. Geburtshülfe und Gynäkologie*, 1909, Band xxx, Heft 4.

² *Ibid.*

³ *Ibid.*

tumor become infected, pus may form and the necrotic processes may result in the separation of a tumor.

Pozzi¹ calls attention to the influence of pregnancy upon fibromyomata, and the danger of the formation of pus and gangrene. Twisting of the pedicle is subserous tumors and partial rotation of the pregnant uterus is also seen. Abortion occurs in from 5 to 6 per cent. of the cases. The diagnosis is difficult, and interference should be practised only when symptoms of danger develop. The artificial termination of pregnancy should not be practised.

Uterine Cancer Complicating Pregnancy. Lockyer² reports 4 cases of carcinoma of the cervix complicating pregnancy. The first, a multipara, pregnant about three months, aborted, after which a foul brown vaginal discharge became more profuse. There was pain on the left side of the pelvis, frequent micturition, and rapid loss of weight.

Upon examination, the cervix was a flat fungoid mass extending also to the vagina. The growth was first cut away, the parts cauterized, and later the uterus and upper part of the vagina were removed by Wertheim's method. The uterus was adherent to the omentum and bowel. The patient recovered well from the operation, but recurrence afterward developed.

The second patient had placenta prævia with severe hemorrhage, and was delivered by forcible dilatation, version, and extraction. Hemorrhage almost proved fatal. After the puerperal period, there was some induration about the cervix which was thought to be cellulitis. She returned, however, after six weeks, in an inoperable condition. Carcinoma had almost destroyed the cervix and infiltrated the base of the bladder.

In the third case, the cancerous mass blocking the vagina was taken for placenta prævia. The patient had had strong labor pains for fourteen hours without result. She was extremely collapsed, and delivery was effected by Cesarean section, with the birth of a healthy male child. The placenta was removed, the uterus closed, ergotin injected, and the abdomen then closed. It was found that the growth had extended into both broad ligaments and above the bladder. The patient recovered well from delivery, but died from the operation two weeks later. The child survived, strong and healthy.

In the fourth case, a multipara had suffered from vaginal hemorrhage irregularly, with an offensive watery discharge. A severe hemorrhage caused her to enter the hospital, when a large cauliflower mass was removed from the anterior lip of the cervix. This was accompanied by very free bleeding. After removing this mass, the hemorrhage ceased; the anterior lip of the uterus apparently had been removed with the tumor. The patient was very anemic from hemorrhage. She was kept

¹ Monatsschrift f. Geburtshülfe und Gynäkologie, 1909, Band xxx, Heft 4.

² British Medical Journal, October 9, 1909.

in the hospital for five weeks, and improved in general health. The growth, however, returned on the left side of the external os.

As the child was viable, it was determined to operate at once, with the hope of arresting the disease in the mother. The child was readily delivered by section, and the uterus was removed by Wertheim's method. The mother made an uninterrupted recovery, and was well when last heard from, six months after operation. The child died twenty-five hours after birth.

The writer calls attention to the value of Wertheim's method and considers it the most efficient of all.

Double-sided Dermoid Cysts Complicating Pregnancy. Petri¹ reports the interesting case of a multipara about three months pregnant, in whom a diagnosis of ovarian tumor upon the right side had been made. This patient had suffered from cramp-like pains which at times became very severe. As the abdominal walls were thin, a tumor upon each side of the uterus could be made out, that upon the right side being much the larger. The character of the pain and other symptoms pointed to torsion of the pedicle.

Operation was performed, with lumbar anesthesia by scopolamin-morphine. A dermoid tumor with twisted pedicle was present upon each side of the uterus. The uterus was pregnant several months. An uninterrupted recovery, without the cessation of pregnancy, followed the operation.

In this connection, the statistics of Fehling are of interest. He found in his cases that 33 per cent. of pregnancies complicated by ovarian tumor are interrupted. Heil, in 64 ovariectomies upon pregnant patients, saw pregnancy interrupted in but 6 cases. Fehling believes that the causes of abortion in these cases are present before the operation, and that the condition is no contra-indication to surgical interference. Pfannenstiel would not disturb ovarian tumors situated favorably, and in cases where the patients had already born children without difficulty. He would, if possible, avoid interference until after the viability of the fetus.

In operating upon these patients, it has often been observed that a small portion of normal ovarian tissue containing corpus luteum is present. This throws an interesting light upon the function of the corpus luteum, and the influence exerted by it upon the implantation of the ovum and its development.

A case of Essen-Möller is cited, of a woman who, 269 days after double ovariectomy, with removal of the corpus luteum, gave birth to a normal living child. This would indicate that the corpus luteum was not essential for the development of the ovum.

¹ Zentralblatt f. Gynäkologie, 1909, No. 30.

Pregnancy Complicated by Ovarian Cyst with Twisted Pedicle. Rushmore¹ reports the case of a multipara who thought herself about three months pregnant, admitted to the hospital because, on the day previous, she had cramp-like pain low down on the left side. This was somewhat relieved by morphine.

She was examined under chloroform by a physician who made a diagnosis of pregnancy with ovarian tumor, and advised operation. There had been no bleeding, no leucorrhea, no dysuria, but there had been constipation for forty-eight hours. Upon examination, the patient was in considerable pain, without special rise of pulse or temperature. The abdomen was distended by an indistinct mass reaching half-way from the symphysis to the umbilicus. This was slightly tender, and higher upon the left side than upon the right.

Upon vaginal examination, the cervix was anterior, the fundus half way to the umbilicus and posterior to the cervix, a tender mass bulging into the posterior fornix.

Operation was performed under scopolamin-morphine and chloroform. Upon examination, the uterus was normal and pregnant about four months; behind the uterus in the pelvis was a cyst from the left ovary, dark purple in color, almost black. The pedicle was twisted one and a half times, the tissues friable. All the dark congested friable tissue was removed, including a small part of the uterus, which bled freely. The uterus contracted several times during operation. Oozing was checked with catgut sutures and the abdomen closed. The patient made an uninterrupted recovery, without abortion. Pregnancy continued to term, labor was normal, and the child well developed.

Upon examination, the tumor was a strangulated dermoid cyst of the ovary. The Fallopian tube was partially strangulated, and there were infarcts in the tube and ovary.

Rushmore cites the earliest described case of strangulated ovarian tumor complicating pregnancy, operated upon by Thornton, in October, 1875. The patient was the mother of a child, aged fifteen months, and placed under the care of Spencer Wells. The abdomen evidently contained a cyst upon the right side, with the uterus enlarged four and a half months. Playfair diagnosticated ovarian tumor just after her confinement. Six months before labor she had an attack of severe pain, probably due to the tumor.

At Spencer Wells' request, Thornton tapped the tumor, removing ten pints of fluid. The patient gradually developed a very rapid pulse, cold perspiration, and suppression of urine, with a normal temperature. Operation was undertaken, the case terminating fatally. The child was alive a few hours before the operation, but no effort was made to save its life.

¹ Surgery, Gynecology, and Obstetrics, November, 1909.

The case illustrates the danger of tapping an ovarian tumor complicating pregnancy.

In the statistics collected in 81 cases, the youngest patient was nineteen, and the oldest forty-three years. Dermoids are most frequent about the thirtieth year, and from twenty-five to thirty-five the greatest number of children are born. The relative percentage of married and unmarried women having ovarian tumors is 10 to 6. The mobility of the tumor, and the tendency to twisting are increased by the relaxed condition of the abdomen in multiparous patients. The third and fourth months of gestation comprise the period in which twisting of the pedicle is most apt to occur. The mobility of the uterus is greatest at this time, as the fundus is near the brim of the pelvis, and this undoubtedly influences the occurrence of torsion. In 35 cases, there was a history of pelvic disease before the present illness. In 1 case, an abdominal tumor had been discovered six years before, as an obstacle in the second pregnancy but the patient had done well and no operation was performed. In four following pregnancies the patient experienced no difficulty from the tumor.

Almost all the cases gave a history of sudden and severe pain, with not infrequently fainting, weakness, and collapse. The pulse rate was slightly increased, with little change in the temperature. This condition is most often confused with ruptured ectopic gestation, and occasionally with inflammatory disease. Cases arise with equal frequency from each of the ovaries. The exact nature of the tumor could not be determined in many cases, as the tumor was extensively altered by gangrene. Very few were found to be malignant. The smaller the tumor, the greater the liability to twisting of the pedicle. The number of twists varied from three and a half to one, and the direction of the twist is opposite to the side on which the tumor is situated; thus a right-sided tumor would have a left spiral.

Twisting of the pedicle may cause complete or incomplete stoppage of circulation. In the former, both arteries and veins are included. Following the twist, there occurs hemorrhage into the tumor, with the gradual development of gangrene.

The maternal mortality of the cases studied was 5.62 per cent. These deaths varied from sixteen hours after operation to sixteen days. Usually death occurred from septic infection. The mortality of these cases, with operation, as given by others, varied from 2.46 per cent. to 16.9 per cent.

Pregnancy was interrupted in a little more than 25 per cent. of cases.

The fetal mortality, after ovariectomy and pregnancy, including tumors with twisted pedicle, is variously estimated from 11 to 27.17 per cent.

The percentage of ovarian tumors complicating pregnancy is variously estimated, the highest percentage being 3.45 per cent. The percentage

of ovarian tumors having twist of the pedicle was estimated by Spencer Wells at 2.4 per cent., and by Küstner at 38.8 per cent.

It can no longer be questioned concerning the duty of the operator in these cases. Under operation, in competent hands, the maternal mortality is lessened 6 per cent., while without operation a maternal mortality of 80 per cent. was quoted. Whether the patient should be operated upon as soon as she is seen will depend upon her condition and the possibility of improving it, or of securing surroundings better adapted to operation. There can be no doubt about the propriety of removing these tumors as soon as possible.

That an ovarian tumor may exist during pregnancy without attracting attention until its pedicle becomes twisted is illustrated in a case which I operated upon for contracted pelvis. The woman had lost a child previously in difficult labor, and was admitted to the hospital in the latter weeks of pregnancy to improve her condition before gestation. As the head failed to enter the pelvis, she was delivered by Cesarean section. After performing the section and closing the uterus, an ovarian tumor, whose existence had not been suspected, was examined and found to have a twisted pedicle. Although the color of the tumor was dark, gangrene had not begun, and the tumor had flattened itself in such a way as to form an irregular mass moulded to the cavity of the abdomen. Its pedicle was twisted several times, and there were light adhesions about the tumor. Its removal did not complicate the patient's convalescence in the least. The patient gave no history of symptoms referred to the tumor, and had never suspected its existence.

Torsion of Uterine Fibroma during Pregnancy. Piquand and Lemeland¹ furnish a paper, a portion of which had been previously published in the *French Review of Gynecology*, upon this subject.

These cases are of two varieties, one where the pedicle of the tumor only is twisted; and another, those cases in which the twist implicates the womb as well. The frequency of the two is practically the same; 13 cases of the first, and 12 of the second variety, are quoted.

In these cases, operation or postmortem confirm the diagnosis. Primiparous women above the average age are most subject to this accident, and in the early period of gestation. The attachment of the pedicle of the tumor to the side of the uterus, and its insertion to one side of the centre of the tumor, are an important factor in causing the complication. Large tumors, and those shaped like an egg or kidney most often become twisted, although the pedicles of such tumors may be less than the average in length and of considerable thickness. This complication usually results from the pressure of the intestine. Its occurrence is also furthered by the fact that the tumor is not symmetrical. Very rarely the formation of pus and necrosis develop. Usually, the condition results in congestion or inflammation only.

¹ L'Obstétrique, July, 1909.

No symptoms whatever may be caused, and if the patient had not been examined before pregnancy and the tumor recognized, its existence might not be suspected. In some cases, the size of the myoma increases while its mobility is lessened and the tumor becomes softer. There is often sufficient tenderness and tympany to make an exact diagnosis impossible. Many cases are supposed to be obstruction of the bowel. Unless the patient had been examined before pregnancy and the tumor ascertained, the case could not be differentiated from acute appendicitis or ovarian tumor.

When the symptoms are severe, the condition is a critical one. In 25 cases, 22 were operated upon and 2 died; 3 patients died without operation.

As soon as the diagnosis is made, operation should be done, and, if possible, enucleation practised. Should this be difficult, hysterectomy is indicated.

Pregnancy Complicated by Myomata. At the recent International Congress of Medicine, Martin, of Berlin, believed that the increased circulation of the uterus caused by pregnancy, favored the development of myomatous germs already present.

Winter's statistics show that about 20 per cent. of patients less than forty years old, conceive after these tumors are removed, and Martin adds 14 cases of his own to these statistics. Myomatous tumors do not prevent the occurrence of pregnancy.

A study of these cases shows that the number of myomata present, their location, and their size, have no effect upon the occurrence of pregnancy.

In discussion, Kufferath condemned the induction of labor or abortion, as almost invariably followed by septic infection. Pozzi had observed great danger from the rapid growth of myomata during pregnancy producing severe pressure.

In some cases, edema with infiltration, displacement of the uterus, necrosis, and softening of cystic degeneration in the tumor, had developed. In some cases, pregnancy was apparently uninfluenced by the tumor itself, but its presence produced displacement and incarceration of the uterus with compression of the bladder or bowel, or nerves and blood-vessels, or torsion of the tumor or of the uterus. In 5 or 6 per cent. of these patients there is abortion, while premature labor is less frequent. In the early months, a diagnosis of myoma complicating pregnancy may be very difficult, and often it is necessary to wait until signs of fetal life can be detected. Surgical interference should, if possible, be myomectomy; but, if this is dangerous, hysterectomy must be performed.

An Obscure Case of Ovarian Cyst in Pregnancy. Chammayon and Gilles¹ describes the case of a girl, aged sixteen years, attempting suicide

¹ Comptes Rendus de la Société d'Obstet. de Gyn. de Paris, May, 1909.

with poison, and suffering from gastro-intestinal irritation as the result. It was suspected that illegitimate pregnancy caused the attempt at suicide.

The period of pregnancy was estimated at from two to two and a half months. Gestation was confessed by the patient, but it was asserted that conception had occurred less than a month previously. She was kept under observation, and after a month had passed the tumor became displaceable, as large as an orange, solid, and easily moved. Evidently the growing womb had pushed upward an ovarian tumor.

Upon operation, a dermoid was removed. Pregnancy was uninterrupted, delivery occurring five months later. The case was obscure because of the absence of history, the fact that the tumor could not easily be recognized, and the confusion concerning the probable period of gestation.

THE TOXEMIA OF PREGNANCY.

The Treatment of Pernicious Nausea by Adrenalin. Rebaudi¹ draws attention to the difficulty of treating cases of pernicious nausea, and the failure of most methods of treatment to produce an effect. He recognizes the hysterical element in many cases, the irritation of the nervous system evidently proceeding from the growing uterus. Where there is some abnormality in the genital tract, as retroversion of the uterus, tumor, endocervicitis, or stenosis, the irritation of pregnancy is greater, and the tendency to vomiting much increased.

The greater number of cases of pernicious nausea must be considered as toxic, originating not only in the mother, but also in the tissues of the growing ovum. In addition to the irritation produced by the growing uterus, we have the various toxins formed by the alteration in the secretions incident to pregnancy; thus, increased salivation is present in many cases. It is also observed that irritability of the nasal membrane, sometimes with nose bleed, illustrates the irritation of the vasomotor system. It is thought that the cells of the corpus luteum act also as a powerful irritant in these cases.

Freund observed that the application of adrenalin to the nasal mucous membrane produced good results in checking the vomiting of pregnancy.

The writer, in Bossi's clinic in Genoa, had some excellent results by the internal administration of adrenalin or other organic products containing adrenalin, in the treatment of nausea. Various explanations were given for these results, but the writer believes that they are due to the action of adrenalin on the vasomotor nerves, and its tonic influence upon the nervous and muscular system.

He describes the case of a patient, aged twenty-two years, with a good

¹ Zentralblatt f. Gynäkologie, 1909, No. 44.

previous history, pregnant for the first time. The patient presented the usual symptoms of toxemia—frequent headaches, vasomotor disturbance, lessening of appetite, indigestion, obstinate constipation, and pyalism. Nausea gradually developed and later vomiting, which threatened the general health of the patient. She grew worse, so that she was unable to be up and about; became emaciated and anemic, complaining of thirst, sleeplessness, with attacks of palpitation of the heart, unconsciousness, and cramp-like pains in the epigastrium. So dangerous was her condition that the interruption of pregnancy was seriously considered as the only means of saving her life.

When the case was seen by the writer, the patient was very pale, much prostrated, and frequently endeavored to vomit severely. The pulse was small, weak, rapid, and of low tension. The tongue was dry and coated, the breath offensive; obstinate constipation was present; the abdomen somewhat tympanic and tender; the liver and spleen apparently normal. The urine showed diminution in chlorides, but no glycosuria.

Upon vaginal examination, beyond a pregnancy of three months, nothing abnormal was found.

As no improvement had followed other methods of treatment, ten drops of a 1 to 1000 solution of adrenalin were given by the mouth, morning and night. For the first three days rectal injections containing twenty drops of laudanum were given. This treatment not only caused no irritation, but was followed by a very rapid improvement. The vomiting ceased on the second day, and on the third day the patient was able to retain a small quantity of liquid nourishment taken ice cold. The improvement continued steadily, the uterus increasing constantly in size. Fetal life was felt at the usual period and the spontaneous birth of a living child subsequently occurred.

The Etiology of Eclampsia. In the *Journal of Obstetrics and Gynecology of the British Empire*, October, November, and December, 1909, Holland publishes an extensive analysis of recent work done to determine the etiology of eclampsia.

He first considers the effect produced by eclampsia upon the body in the morbid anatomy, with various organs and tissues, and the chemistry of the tissues and secretions.

Quoting the work of Schmorl and Winter, it is found that the changes in the body produced by eclampsia form a distinct condition peculiar to eclampsia itself. It is true that in some cases one organ may seem not to be affected, but this is true of other severe intoxications, and such variations from the general rule are to be explained by the dose of the toxin, its concentration, and the time during which it is active before the death of the patient. It is true that in other severe infections, changes in each organ considered individually and of a similar nature, have been found; but in eclampsia the different organs of the body are

simultaneously altered, and in a characteristic manner. Eclampsia may now be diagnosticated from an autopsy only, just as typhoid may be recognized by the characteristic lesions in the small intestine, mesenteric glands, and the spleen.

Konstantinowitch's research on the *liver changes* in eclampsia is quoted, showing the lesions at the periphery of the lobule in which the contour of the cells becomes more rounded; the nuclei stain poorly; the peripheral capillaries of the lobule are dilated by the endothelial nuclei and show alteration. These are degenerative changes, evidently produced by a toxin. Lesions in the periphery of the lobule result in interstitial hemorrhage between the liver cells, with collections of blood between the cells and the walls of the capillaries, resulting in degeneration of the endothelium of the capillaries and renewed hemorrhage. Capillary thrombosis is the important lesion produced by the toxin which brings about degeneration of the liver cells. The slowness of the circulation in the liver, and the increased coagulability of the blood, favor the formation of these lesions. The cells of the liver become gradually necrotic. As the toxemia proceeds, thrombosis becomes more extensive and the characteristic changes more widely spread. The writer believes that from the examination of the liver alone the diagnosis of eclampsia can be made.

The *suprarenal glands* have been studied by Chirié and Guieysse, who found that the cortex was hypertrophied, the whole gland becoming hyperplastic and showing greatly increased activity. These changes are not considered causative factors in eclampsia in themselves, but as part of the general toxemia.

In 4 fatal cases, examination of the *thyroid gland* by Potet and Kervilly revealed complex changes. There was cirrhosis of the connective tissue and dilatation of many vesicles, with increased softening of the colloid substance. There was no acute degeneration. Similar changes were found in 3 fatal cases of puerperal sepsis.

The important element of *embolism and thrombosis* is illustrated by the appearance of the liver cells in the bloodvessels of the liver. This, however, does not occur in eclampsia alone, but in other conditions where the circulation of the liver is greatly impeded.

Cells and villi from the placenta were recognized by Schmorl in the *lungs*. Many of these are syncytial cells forming small masses in the vessels. They are probably more frequent in cases having convulsions, and have also been seen in septic cases, dying after abortion.

The study of this subject led Veit to definitely study the *placental origin of eclampsia*. Two changes are peculiar to the placenta in these cases: One, a general arteritis with edema, is seen in other conditions as well. The other changes are comprised in hemorrhages and alterations in the plasmodium of the villi. Hypertrophy of the villus buds combined with edema, arteritis, and infarction are the lesions most significant.

Great variations in the number of red blood cells and alterations of the leukocytes have also been observed. In eclampsia their number is greatly increased. In some the protoplasm was degenerated, and free nuclei were found in the blood.

In the *chemistry of the tissues and secretions*, special importance is attached to the partition of the urinary nitrogen. The urea is greatly lessened, the ammonia was increased slightly during the attacks, falling below normal during recovery. The uric acid was very little affected.

Special attention is called to the researches of Ewing and Wolf, who studied the urea, ammonia, uric acid, and creatinin in eclamptic cases.

Organic acids have also been detected in increased quantities, the amino acids being especially significant. The chlorides have been found diminished. The chemical examination of the eclamptic liver showed ferments of many varieties, the most important of which is a proteolytic ferment which breaks down protein matter into its ultimate constituents.

The *alkalinity of the blood* is diminished in varying percentages. Hemoglobin is found frequently in the blood serum, but hemolytic toxins have not been detected. By cryolysis the freezing point of the blood is found considerably altered from the normal. Lactic acid is present in some cases before convulsions, but is not found in the urine in epilepsy. The albumin in the blood is slightly decreased, while the fibrinogen is much greater than normal.

In classifying toxemia and eclampsia, it is found that this condition is a disease not of one but of many organs of the body, a profound toxic disturbance of the whole system arising from changes produced in the body itself, and not the result of substances introduced from without. It is an autointoxication produced by products of metabolism that have been formed within the tissues of the body. It is intimately associated with abnormal cell activities. The poisons producing toxemia and eclampsia may result from failure at elimination, failure of neutralization of chemical combinations, as in diseases of the liver, and failure of the chemical transformation of metabolic products. Excessive formation of toxic chemical substances produced by autolytic changes in the various organs is also a factor.

Eclampsia resembles many other conditions, especially acute yellow atrophy of the liver, in some cases resembling uremia, in others, profound bacterial intoxication.

If the general changes in the body are considered, we find them to be essentially necrotic in character, affecting cells of various organs, especially the liver and kidneys. A profound disturbance of metabolism is present, shown by abnormalities in the urinary nitrogen, the presence in the blood and urine of aminol acids, lactic acid, and other abnormal end products of protein, the presence in various organs of the body, as in the liver, of abnormal end products of protein, and a high percentage of undetermined nitrogen in the urine. There is a profound change

in the blood, consisting in extensive capillary thrombosis, increased coagulability, diminished alkalinity, increased amount of fibrinogen, destruction of red corpuscles as hemoglobin in the serum and urine, leukocytosis, and fatty degeneration of the leukocytes.

The natural question arises, What can cause such extensive alterations in the organism? The most important element is the saturation of the body with the end products of proteins and autointoxication.

In attempting to correlate chemical and anatomical changes, autolysis of cells accounts for most of the phenomena. The end products of liver autolysis are many of the substances present in toxemia. There is abundant evidence from the macroscopic and microscopic study of the liver that this condition is present.

Autolysis is produced by a ferment, and ferments are highly toxic, not only in the cells which contain them but in the body generally. The injection of ferments into animals produces thrombosis and hemorrhage, increase in fibrinogen, and degeneration in the liver, kidneys, and heart. The aminol acids and similar substances increase the activity of the autolytic ferments. The anatomical feature is extensive intravascular coagulation. Acidosis accounts for the diminished urea, increase in ammonia, and other chemical phenomena.

The effort has been made to trace the origin of ferments producing toxemia and eclampsia to the fetus, but the cases of vesicular mole reported by Hitschmann, Gross, Falk, Olshausen, Kroemer, and Dienst, in which eclampsia occurred in the absence of the fetus, show that the fetus cannot be the only cause. The anatomical relations of the placenta in contact with the maternal blood, the fact that it is known to possess ferments, experiments with the injection of placental substance, anatomical changes in the villi, the finding of placental cells in the maternal circulation—all these circumstances point to the placenta as the origin of the ferments.

Veit believes that toxemia and eclampsia result from the presence in the blood of placental elements which have not been destroyed by the syncytiolysins. Ascoli believes that eclampsia results from an excess of syncytiolysins. Weitchardt ascribes the causal relation to syncytiotoxins liberated from placental cells by syncytiolysins, as being too great in number to be destroyed by the antitoxins.

The specific placental theory of eclampsia has been vigorously attacked, and severely criticized. Extracts of the placenta have been made and injected into animals without producing specific placental reaction. Biological study has failed to demonstrate the causal relation between placental substances in toxemia and eclampsia. It must be remembered that coagulation can be produced by the injection into animals of necrotic albuminoid tissue, whether placental or other. The extract is highly toxic to animals by causing intravascular coagulation. This action is due to the nucleoprotein contained in the extract, or possibly

to a specific blood coagulating ferment. Special endotoxins do not exist in the placenta.

The study of the placenta shows that autolysis takes place during life in the eclamptic placenta, the process being more than a simply autolysis by the additional production of ferments.

If our present knowledge of toxemia and eclampsia be summarized, it must be concisely stated that a special eclamptic toxin has not been found. The nature of the profound disturbance in protein metabolism producing toxemia and eclampsia rests now upon a firm basis. The products of the disintegration of protein are definitely known, and can be definitely recognized in the nitrogen partition of the urine. Intracellular ferments proteolytic in character, and originating in the placenta, circulate through the body of the mother, causing autolysis in the body cells and producing toxic substances, to which reference has been made.

As regards the precise relation of the placenta to eclampsia, the specific placental theory must be abandoned. The various placental reactions produced in animals do not exist in eclampsia. Placental extracts possess no special and specific toxicity for animals, but cause coagulation and thrombosis, as do extracts from any albuminoid substance. The eclamptic placenta itself is not especially toxic. The intracellular ferments of the placenta are greatly increased in eclampsia. It is their passage into the circulation, with autolytic products from the placenta which produces the coagulability of the blood and the autolysis in various portions of the body characterizing toxemia and eclampsia.

Eclampsia Treated by the Administration of Chloroform in 1849. Fothergill,¹ from records of medical practice kept by his father, describes the treatment of a case of eclampsia in 1849. The patient developed during labor, strong eclamptic convulsions. She was bled, and as she was extremely restless, chloroform was used, and the patient was spontaneously delivered.

As the convulsions persisted after labor, counterirritation was applied to the spine and calves of the legs, cold was applied externally, calomel and croton oil were given, with copious enemata. The patient made a complete recovery.

This is probably one of the earliest cases on record in which chloroform was employed for this purpose.

Fourteen Autopsies in Eclampsia. Welch² reports 14 autopsies on eclamptic patients. From these, he concludes that the liver lesions in eclampsia are not uniform. Hemorrhages, central necrosis, autolysis, and cloudy swelling are found. In the toxemia of pregnancy, the liver lesions also vary greatly. Both the hemorrhagic and central necroses may be present. Emboli from the liver and placental cells

¹ Journal of Obstetrics and Gynecology of the British Empire, July, 1909.

² Bulletin of the Lying-in Hospital of the City of New York, June, 1909.

produce the hemorrhagic lesions in eclampsia. Thrombi are formed from blood plates and fused red cells and by a solution of vascular endothelium. Increased blood pressure makes hemorrhages more extensive.

So far as the anatomical study of eclampsia is concerned, an enzyme is the most probable causative agent.

The Prophylactic Treatment of Eclampsia. Stroganoff¹ believes that the treatment of eclampsia must be empirical, because we have not a perfectly clear conception of its cause. As the disease is comparatively short in the majority of cases, not lasting longer than twenty-four hours, recovery may be hoped for if the patient can be sustained and controlled during this period. In most cases, delivery seems to lessen the convulsion, as does the use of morphine, chloral, and chloroform. It is also proved that external irritation of the patient increases the convulsions. The dilution of the toxins contained in the blood is of primary importance in mitigating the convulsions.

For the last ten years Stroganoff has employed a system of treatment designed to cover these points. He uses muriate of morphine hypodermically, gives the patient chloroform to mild narcosis, and makes a thorough examination. If the conditions are favorable for delivery, the patient is delivered. If not, she is placed in an isolated room where every possible source of irritation and excitement can be excluded. For this reason, warm baths and packs are not used.

If it is necessary to cleanse the skin, it is done by gentle rubbing with wet towels. If the bowel is distended with feces or gas, injections are given. Chloral hydrate is given with milk. Chloroform is used to prevent convulsions. Oxygen is used as continuously as possible by inhalation. The original dose of muriate of morphine is repeated in two hours, and the patient is kept narcotized by the agents described, as long as the tendency to convulsions persists. When the chloral and morphine are absorbed and begin to produce their effect, the use of chloroform is less necessary. The room is kept dark and absolutely quiet, external noise is prevented, the patient is disturbed as little as possible, and the temperature of the room remains constant.

In most cases, under such narcosis, labor develops speedily, and the child is usually spontaneously expelled with very little suffering. The same treatment is continued after delivery, and is varied in proportion to the severity of the symptoms. At the end of the first day of the disease one should expect cessation of the convulsions, a clearer condition of the mind, increased secretion of urine, lessened headache, and pulse tension. If the indications are present, chloral is given three times daily for several days afterward. Should symptoms of edema of the lungs appear, great caution is necessary in using the narcotic, and

¹ *Monatsschrift f. Geburtshülfe und Gynäkologie*, 1909, Band xxix, Heft 5.

the doses must be lessened, or the drugs discontinued. As much as 4 or 5 grams of chloral hydrate, and from 3 to 4 centigrams of muriate of morphine with chloroform narcosis, have been used in the course of the first five or six hours. In difficult cases, vaginal Cesarean section may be employed. In some cases the forceps suffices, with version if the head is not engaged. In many cases, rupture of the membranes produces a favorable influence upon the convulsions. Salt solution, milk, or weak tea is injected by the bowel. When the pulse reaches 110 to 120, digitalis is given freely. Catheterization, hypodermic injections, and examinations of various sorts are made under partial chloroform narcosis.

To increase the action of the kidneys, hot-water bottles are placed about the patient, and, to increase the action of the skin, the patient is kept thoroughly warm. Dry heat is preferred to moist heat as being less depressing to the circulation. Dry cups are freely used where a tendency to edema is present.

Where eclampsia occurs without labor, cases so treated often escape many convulsions. Increased elimination frequently develops, and the patient recovers from eclampsia, and later passes into normal labor. In other cases, nephritis develops after eclampsia.

In the first 58 cases so treated, there was no maternal death from eclampsia. One patient died from croupous pneumonia. The mortality of the children in this series was 13.5 per cent. Two years later, in a second series of 126 cases, the maternal mortality was 6.3 per cent.; the fetal mortality, 25.8 per cent. In a third series of 83 cases of eclampsia reported by Primo, the maternal mortality was 8.5 per cent.; the fetal mortality 22.2 per cent. In a later series of 95 cases, the maternal mortality was 6.6 per cent.

The entire group of cases numbers 330 treated by the prophylactic measures described, with a maternal mortality of 6.9 per cent. Pneumonia, septic infection, and hemorrhage were the causes of death.

Stroganoff excludes from his cases those of eclampsia without convulsions, and believes that the mortality from eclampsia only should be reduced at least to 2 per cent. The fetal mortality was 21.6 per cent.

The average number of convulsions was reduced to 3.5 per cent., while in other hospitals in St. Petersburg not employing this method, the average number of convulsions varied from 6.9 to 9.5 per cent.

Stroganoff is enthusiastic in urging this method of treatment, and asserts that he knows of few diseases in which the therapeutic management of the case gives such brilliant results. He believes that vaginal Cesarean section, nephrotomy, or decapsulation, or the combination of these operations, are an unjustifiable interference on the part of the surgeon. In addition, he describes 30 cases, making a total of 360, with a maternal mortality of 6.6 per cent.

A detailed description of some of the most interesting cases, in some of which autopsies were obtained, is appended.

The Toxicity of Blood Serum in Eclampsia. Graf and Landsteiner¹ report the results of experiments upon animals to determine the toxicity of the blood serum in eclampsia.

In 19 cases, the blood serum was definitely more poisonous than normal in 13. The poisonous dose varied from 2 to 10 per cent. of the body weight of the animal. If the serum was not promptly used, its virulence decreased very considerably; thus in from one-half to one hour after the serum was taken its toxicity had diminished 60 per cent. It cannot, however, be definitely proved that this increased toxicity is peculiar to eclampsia only. With blood serum taken from other diseases, similar results were obtained.

It seems probable that in eclamptic serum there is an increase in the toxins normally found in the blood rather than the production of an entirely new substance.

Decapsulation of the Kidneys for Eclampsia. Sippel² adds to 36 cases of decapsulation of the kidney for eclampsia, 1 reported by a colleague, and the 38 reported by himself.

The first case was treated by the subcutaneous use of salt solution and digitalis. Vaginal Cesarean section was done, with delivery by version and extraction and the production of extensive lacerations extending to the base of the bladder. The patient's condition did not improve and accordingly, decapsulation of the kidneys was performed. The left kidney was first freed and the capsule opened without hemorrhage. The kidney was swollen, hard, pale, and by artificial light, reddish gray in color. The capsule was thick and tense. The other kidney was undisturbed. The secretion of urine became freely established, and albuminuria became less. The patient's improvement, however, was but temporary, and death occurred three days after decapsulation.

An autopsy and microscopic study of the liver and kidneys failed to reveal the cause of death. The patient was surgically clean, the incisions were healing, and there was no hemorrhage. The kidney which had not been decapsulated was similar in condition to the one examined by operation.

In 38 cases which Sippel has collected, 17 perished; 4 of these deaths were from causes other than eclampsia; 1 from ulcer of the stomach, 1 from pneumonia, 1 from septic infection of the wound, 1 from iodoform poisoning; 21 of the 38 recovered—55.25 per cent. In 81.5 per cent. of the cases, including some of those who died, there was marked increase in the secretion of urine. In 18.5 per cent. there was no increase in urinary secretion after operation.

Sippel believes that indications for the operation in eclampsia rest

¹ Zentralblatt f. Gynäkologie, No. 4, 1909.

² Monatsschrift f. Geburtshülfe und Gynäkologie, 1909, Band xxx, Heft 5.

entirely with the quantity of urine secreted. The only effect which can be directly ascribed to the operation is increased diuresis.

It is interesting to note the condition of the kidneys in the patients operated upon. They were of three types: In the first, the kidneys were swollen, bluish red, and presenting the appearance of venous stasis. In the second variety, the kidneys were swollen, but anemic, with acute parenchymatous swelling, suggesting the possibility of a primary occlusion of the ureter. In the third form, the kidneys were edematous and soft in consistence.

Alsberg¹ reports 4 cases of decapsulation in eclampsia, with 3 recoveries, and 1 death from pneumonia. An autopsy could not be obtained. A record was kept of the amount of fluid taken by the patient and the quantity of urine secreted. The effect of the operation was that described by Sippel—a marked increase in diuresis.

Opitz² reports 3 successful cases in which glaucoma of the kidney was present. The operation was done speedily, in from ten to fifteen minutes. In one case, hemorrhage from the kidney was so violent that gauze packing was necessary.

Rühle, in 26 cases of eclampsia, had a maternal mortality of 7.7 per cent., with a fetal mortality of 23 per cent. He would limit decapsulation to those cases in which eclampsia developed after emptying the uterus. In this series, there were 15 such cases, of whom 14 recovered without operation. In the case that died, decapsulation might possibly have been of use.

Fritsch would limit decapsulation to those cases in which diuresis does not become established after the uterus is empty.

Falgowski³ explains the effect of decapsulation by the lessening of the tension upon the capsule of the kidney which permits the paralyzed circulation to resume its function, and thus discharge the poisonous materials which have accumulated. The arterial hyperemia which follows decapsulation increases obstruction and promotes elimination. The epithelia of the kidneys, which have been rendered incapable of performing their function through venous stasis, resume this function when the circulation of the kidney becomes normal.

The Toxemia of Pregnancy. Fellner⁴ reviews the recent literature of the toxemia of pregnancy, and calls attention to a case, reported by him in 1901, of thyroid toxemia. He believes that it is not the thyroid alone which is involved in the toxemia of pregnancy, but that many of the ductless glands of the body are stimulated to increased function, which may become disordered, thus giving rise to the formation of toxic products.

¹ Zentralblatt f. Gynäkologie, 1909, No. 27.

² Monatsschrift f. Geburtshülfe und Gynäkologie, 1909, Band xxx, Heft 2.

³ Zentralblatt f. Gynäkologie, 1908, p. 37.

⁴ Monatsschrift f. Geburtshülfe und Gynäkologie, 1909, Band xxix, Heft 1.

He calls attention to the development of epilepsy in pregnancy and the puerperal period in patients of unstable nervous system in whom the toxins formed in pregnancy act as irritants. He has observed in the puerperal period, after one or two days of uninterrupted recovery, mental disturbances which ceased on the removal of a small portion of the placenta. He attributes the mental disturbance to toxins from a decomposing placental piece. He thus ascribes to the placenta a causal relation, and believes that the placenta and not the fetus is the source of the toxins of pregnancy.

Osteomalacia he believes to be produced by substances from the placenta which disturb the normal formation in the body of phosphoric acid and calcium.

He also draws attention to the evidence in favor of the ovary and corpus luteum, especially as being concerned in this process. Bossi has seen osteomalacia developed after the removal of the suprarenal bodies, and others have treated osteomalacia with partial success by administering adrenalin.

He calls attention to the toxemia of menstruation, which seems analogous in a lesser degree to the toxemia of pregnancy. He believes that cases in which menstruation develops late are most likely to have, should pregnancy occur, its characteristic toxemia.

He recognizes, in short, two special causes for the toxemia of pregnancy: A disturbance in ovarian secretion, or the increase in the toxemia of menstruation, aggravated by the pregnant condition.

A Pathological Explanation for the Symptoms of Eclampsia and Toxemia in Pregnancy. Welch,¹ in a paper before the section of Obstetrics of the American Medical Association, described autopsies upon patients dying of toxemia and eclampsia.

From autopsy findings it would seem possible to explain some of the most prominent symptoms of threatened eclampsia. The headaches result from intracranial disturbance with pressure upon the dura mater, which receives a nerve supply from the fifth cranial pair. The intracerebral conditions are congestion, edema, and hemorrhage, producing irritation. The disturbances of vision result from circulatory disturbances and edema about the base of the brain.

Ophthalmoscopy shows a pallor of the optic nerve, but in most cases no definite lesions. The petechial eruptions in the skin result from small vessels in which thrombi formed, emboli lodged, or in which the endothelium has been destroyed. The nausea and vomiting may result from central or peripheral causes. The vomiting centre may be irritated by poisonous substances circulating in the blood. The peripheral causes are reflex, such as the enlargement of the womb, disturbance of the bowel, and irritation of the mucous membrane of the stomach through

¹ Journal of the American Medical Association, October 23, 1909.

the elimination of poisons. Edema results from alterations in the blood, in the vessel wall, or marked change in the blood pressure.

In edema, there is anemia with destruction of the endothelium of the vessels, and increased blood pressure. Jaundice results from cloudy swelling of liver cells compressing bile capillaries, and causing bile to overflow into the blood and lymph capillaries.

In the liver, hemorrhages, central necrosis, and autolysis or cloudy swelling are often found. These lesions are not uniform in toxemia, and there may be hemorrhagic or central necrosis, both of which are present in eclampsia. These are produced by liver and placental cells; emboli by thrombi formed from blood plates in fused red cells, and by the damage of vascular endothelium. Increased blood pressure naturally makes the hemorrhages more severe.

If we search for the agent which produces the hemolysis and cell destruction, it seems most probable that it is an enzyme.

Two Hundred and Fifty Cases of Eclampsia. McPherson¹ gives the results of his study of eclampsia in the wards of the Lying-in Hospital of New York.

The greatest number of cases occurred in February and March; the least in December and January. The frequency of eclampsia was 1 in 60 labors, or 1.7 per cent. This represents probably the maximum frequency, while the occurrence of eclampsia in private practice is estimated at 1 in 1075 labors, or .09 of 1 per cent.

The condition is almost twice as common in primiparæ as in multiparæ, while multiple pregnancy is a recognized cause.

In America, postpartum eclampsia is second in frequency of occurrence. In these cases, eclampsia was antipartum in 56 per cent., postpartum in 34.4 per cent., and intrapartum in 9.6 per cent. The youngest patient was fifteen years, the oldest forty-eight years of age, the greatest number of cases occurring between twenty and twenty-five years.

The maternal mortality was 30.8 per cent; the fetal mortality, 44 per cent. Of the maternal deaths, 62.3 per cent. occurred when eclampsia developed before labor; 31.1 per cent. when eclampsia developed after labor; and 7.7 per cent. when eclampsia developed during parturition.

In the out-patient service, on the contrary, the records show a mortality of but 23 per cent.

It is recognized that in threatened eclampsia, vigorous stimulation of excretion is indicated. So soon as convulsions occur the writer believes that the womb should be emptied. In these cases, the maternal mortality following version, was 38.5 per cent.; forceps delivery, 20.5 per cent.; induction of labor, 42.8 per cent.; craniotomy, 28.5 per cent.; and Cesarean section, 40 per cent.

The fetal mortality after podalic version was 62.9 per cent.; after

¹ Journal of the American Medical Association, October 23, 1909.

high forceps, 44.4 per cent.; with the induction of labor, 28.5 per cent.; and after abdominal Cesarean section, *nil*; 100 per cent. of living children being born. The high mortality figures are not due entirely to eclampsia, but to delay in sending the patient to the hospital.

Regarding *Cesarean section*, abdominal section is certainly indicated in elderly primiparæ with undilated and undeveloped birth canal. Vaginal Cesarean section is not an easy operation, requiring technical skill and hospital facilities.

In postpartum eclampsia, convulsions should be controlled and elimination stimulated. The writer has used scopolamin hydrobromate $\frac{1}{100}$ grain, with morphine sulphate $\frac{1}{16}$ grain, with satisfaction. Copious rectal irrigation with salt solution, bleeding, and intravenous transfusion of salt solution, hot packs, and catharsis, have given good results. In some cases, thyroid extract has been useful, and in some, *veratrum viride*.

Eclampsia and Parathyroid Bodies. Seitz¹ draws attention to the disturbance produced in the body, and the production of tetanus following the removal of the parathyroid bodies.

Seitz has reviewed these experiments, and sought in eclamptic cases to find evidence that the extract of the parathyroid might be used to advantage in the treatment of eclampsia. His studies on this subject lead him to conclude that during pregnancy the parathyroids become softened and are more vascular. The chromophile cells are increased and are better developed than in the non-pregnant condition. In eclampsia, these cells are lessened in number, or entirely disappear. This process is believed to be secondary and not to depend upon those causes which produce eclampsia. In eclamptic cases, in the parathyroids there is increased formation of connective tissue, of fat, of colloid material representing pathological processes, and the formation of cysts, or of tuberculosis; but this process cannot be demonstrated as causing eclampsia. The fact that the epithelial bodies are lessened in number does not prove an insufficiency in the function of the glands, for without prolonged and critical observation the true importance and extent of these alterations cannot be definitely made out. Partial or total parathyroidectomy in pregnant animals produces tetanus and not eclampsia. The two conditions are to be sharply differentiated. The so-called eclampsia of animals, as seen in the cow, is not identical with that of the human subject. The extract of the parathyroid bodies cannot be considered a specific in the treatment of eclampsia.

The Value of Bleeding in Eclampsia. Uthmöller² reports 2 cases in which free bleeding seemed to control eclampsia and bring the case to a favorable termination. In one patient, a robust primipara with great

¹ Archiv f. Gynäkologie, 1909, Band lxxxix, Heft 1.

² Zentralblatt f. Gynäkologie, 1909, No. 38.

edema, strong and regular pulse, and deep coma, the extraction of 1250 c.c. of blood was followed by very great improvement.

In the second case, eclampsia developed postpartum, and between 800 and 900 c.c. of blood was taken from the patient's arm, with immediate relief.

The Treatment of Puerperal Convulsions. Little¹ reports the results of 43 patients with convulsions treated in the Montreal Maternity. Four of these were not, strictly speaking, eclamptics, as 2 were epileptics having typical convulsions during pregnancy; another was hysterical, four months pregnant, whose convulsions could be induced by suggestion; while the fourth, who developed convulsions during the puerperal period, showed at autopsy none of the characteristic lesions in the liver and kidneys seen in eclampsia.

The remaining 39 cases comprised 1.66 per cent. of the cases admitted to the Maternity, to which the writer adds 1 case seen outside the hospital making a total of 40.

In 2 cases the patients had a previous history of epilepsy, but during pregnancy developed high blood pressure, marked albuminuria, and in 1, a coagulation time in the blood of 2.25 minutes. These were considered as eclamptic cases and so treated with good results.

The writer finds it difficult to divide his cases into those occurring before, during, and after labor. He has accordingly divided them into eclampsia occurring before treatment, comprising 52.5 per cent. of the cases; eclampsia developed at term, 25 per cent.; eclampsia developed after confinement, 22.5 per cent.; 80 per cent. developed between October 1 and March 31.

None of these cases was complicated by abnormal pelvis. Severe epigastric pain had been observed whenever a complete history was obtainable. There was also a history of pernicious nausea and vomiting. But one patient had great disturbance of vision. The blood pressure usually varied between 160 and 200 m.m. of mercury, although three patients had blood pressure as low as 125, 133, and 150. The coagulation time of the blood in 5 cases showed a marked decrease, the normal being taken as from 5 to 8 minutes. As the patient improved the coagulation time of the blood increased.

The mortality of the series was 4, or 10 per cent.

The 4 fatal cases were all treated by artificial delivery through the vagina; 2 of these died from causes indirectly connected with eclampsia, 1 having acute yellow atrophy of the liver; in 1 there was cerebral thrombosis; of the 2 remaining deaths, the only explanation advanced was that of insufficient treatment, the patients not coming into hospital in time to receive vigorous eliminative treatment.

Of the 15 patients immediately delivered, in 1 the child was not viable,

¹ Journal of Obstetrics and Gynecology of the British Empire, September, 1909.

but in the second, the child was dead *in utero* when the patient came into the hospital. Of the remaining 13 cases, 12 children were born living, or 92 per cent. Of the patients that were not delivered immediately when convulsions developed, but 23 per cent. of the children were born alive—thus making a difference of 69 per cent. of recoveries in the children in favor of immediate delivery. In 3 patients, veratrum was used, with a temporary effect upon the blood pressure. In general, the treatment carried out was immediate delivery through the vagina. Vaginal Cesarean section was performed but once.

It is thought that rapid dilatation of the cervix should not be attempted unless the cervix was softened and in a condition to be dilated without much violence. In using the Pomeroy bag, tears were as frequent as with manual dilatation, and were often jagged and difficult to repair. In cases where the cervix is artificially dilated, it is thought that version is the preferable form of delivery. Chloroform was used to control convulsions, and in bleeding, from 700 to 900 c.c. of blood was taken with benefit. Large quantities of water was given by the mouth, the bowels were freely evacuated, and narcotics and anesthetics were used as little as possible. The stomach was thoroughly washed out, and magnesium sulphate usually introduced through the tube.

For postpartum eclampsia, bleeding was thought especially valuable.

Eclampsia with Hemiplegia. Barret and Harger¹ report the case of a primipara admitted to the hospital in a comatose condition, having been delivered twenty hours previously, and having had more than seventy-five generalized convulsions.

Upon examination, the woman was well nourished, the eyes half closed, corneal reflexes absent, breathing Cheyne-Stokes. The tongue had been severely bitten. The patient was cyanotic; temperature, 103° F. per rectum; respirations, 17; the pulse, 152, and very irregular. The pupils were contracted and the eyes reacted sluggishly to light. The heart impulse was full and bounding, the respiratory sounds harsh. The abdomen was tympanitic, the labia darkly pigmented and edematous, the skin dry and dirty, and the ankles edematous. Upon venesection, but 4 ounces of very dark blood was obtained. This was followed by subcutaneous transfusion, with normal salt solution. The urine contained casts and albumin in large quantities, with blood cells. With hot packs and flushing of the colon with salt solution, the patient very greatly improved. She became partially conscious, but developed paresis on the right side of the face, with total paralysis and loss of reflexes in the right arm. There was also interference with the speech centre, the patient having sensory aphasia. She gradually improved, and when convalescent showed marked weakness in the right arm and hand, with no apparent difference in the strength of the legs. The reflexes were

¹ American Journal of Obstetrics, September, 1909.

normal, sensation was normal, and the eyes negative. She could not comprehend long sentences nor speak the words correctly.

Albumin and casts gradually disappeared from the urine.

Eclampsia followed by Mania. In connection with the cerebral complications of eclampsia, the reviewer desires to place upon record the case of a young German woman, primipara, brought to the Jefferson Maternity, comatose in eclampsia. A stillborn child was born, but the patient's convulsions continued. She was treated by free bleeding with intravenous saline transfusion, the administration of calomel after gastric lavage, and free irrigation of the colon with salt solution. Hot packs were used to a moderate extent.

The patient gradually rallied from her eclampsia, the convulsions ceased, but she passed into a condition of acute melancholy and mania. Her attacks were more frequent at night, characterized by active shrieking delirium, requiring constant restraint. She also wrongly believed that she had been deserted by her husband.

The patient was treated by constant restraint with a canvas detention sheet which allowed her to move in bed without assuming the upright posture. During the intervals of her mania, she gradually took milk, and was treated by intestinal irrigation at regular intervals, and by moderate doses of codein hypodermically. The milk diet was pushed as assiduously as possible.

After a week of active delirium the mania ceased, but melancholia persisted for ten days longer. Then the patient took more food, the pulse and temperature were normal, and she was allowed to get out of bed. A few days after, she had a temperature of 103° F., the pulse above 100, respirations between 30 and 40, ill-defined dulness over the right lower chest, with various rales. There was a scanty dark-reddish sputum. This condition was treated by dry cups, strychnine and digitalis, as the action of the heart was not strong; saline irrigation of the intestine, forced feeding with milk, and moderate doses of good brandy were given.

The pulmonary condition gradually subsided, the patient making in six weeks from the time of her admission a practically complete recovery. She emaciated considerably, but finally became perfectly clear in her mind, and went to her home eagerly and in good general health.

Gangrenous Pneumonia Terminating in Recovery. In the observation of the reviewer, recovery from gangrenous pneumonia complicating eclampsia is rare.

I also desire to call attention to the value of the canvas detention sheet in these cases. This is sufficiently large to cover the patient's bed, and is applied over the body to the neck. The patient's arms are placed in the sleeves, which extend beyond the hands, the ends being fastened loosely to the sides of the bed. The sheet is so applied that the patient can turn in bed upon her side, can raise her head sufficiently to drink

comfortably, but cannot assume the upright posture. It is of great assistance to nurses who care for such patients; and as the sheet is laced to the sides of the bed it makes it impossible for the patient to fall out of bed during a convulsion or a maniacal seizure. It is of value in conserving the patient's strength, and undoubtedly produces a quieting influence. Such devices have long been used in hospitals for the insane, but are not always employed for eclamptic patients.

The Influence of Weather upon the Occurrence of Eclampsia. Schlichting¹ contributes, from Bumm's clinic at the Charité in Berlin, observations on the effect of the weather upon the occurrence of eclampsia.

It was observed that periods would elapse in the work of the clinic when no cases of eclampsia occurred, and that then during a few days three or four cases would be admitted. It seemed possibly useful to analyze the weather conditions during these times, and to trace, if possible, a causal relationship between changes in the weather and the development of eclampsia.

Other observers have studied the same problem. Dührssen, in Winckel's *Handbook of Obstetrics*, believed that in cold and damp weather, eclampsia was more frequent because of the influence of atmospheric conditions upon the overburdened kidneys. Zangemeister, in analyzing 51 cases of eclampsia, found that this complication occurred more frequently in the hot months of summer, at a time when storms most often develop. The frequency of eclampsia seems to be different in different countries, and somewhat in different cities. Thus, in Würtemberg, Döderlein observed but one case of eclampsia in 3561 labors. Meyer-Wirz² could find no definite relation between the condition of the weather and the occurrence of eclampsia. Hammerschlag,³ in 200 cases, concluded that no relationship existed between eclampsia and the weather, but that eclampsia occurs less often in the country than in the city. Büttner,⁴ on the contrary, believes that the causal relationship cannot be denied. Changes in the weather producing chilling of the surface of the body readily increase the number of eclamptic cases. Schatz believed that such chilling of the body more readily occurs in cities than in the country.

In order to study the question in Berlin, Schlichting referred to Behrer's observations upon the climate of Berlin and its vicinity. He finds that the climate of Berlin is anomalous in that it seems a transitional climate from the mild, moist, sea climate of northwestern Germany to the dry continental climate of eastern Germany. The influence of the Gulf stream is undoubtedly felt in Berlin. The heat of summer is modified by free circulation of air. The high atmospheric pressure of the sub-

¹ Archiv f. Gynäkologie, 1909, Band lxxxix, Heft 2.

Ibid., p. 71.

² Monatsschrift f. Geburtshülfe und Gynäkologie, Band xx.

⁴ Archiv f. Gynäkologie, Band lxxv and lxx.

tropical regions in Berlin results from the high pressure over the Atlantic with low pressure in southeast Europe with the passage of old currents of air from the Polar regions, which often produces cool and wet weather during the summer.

In the year, Berlin averages 43 perfectly clear days, and 142 cloudy days. The sky is cloudy at times for months in duration. The hours of sunshine in Berlin average 1672. The average conditions of temperature, as regards its changes, are not worse in Berlin than in many other cities. There are, on the average, about fifteen thunder storms, and sixteen days of heavy fog during the year.

From July, 1904, to June, 1908, there were in the Charité 622 cases of eclampsia. The treatment of these cases was conducted upon the belief that delivery should be effected as soon as possible, and elimination actively stimulated. Various obstetric operations were performed. The mortality rate was a considerable one. Many of these patients did not die from eclampsia inevitably, but from lack of hygienic surroundings during pregnancy, and failure to receive prompt treatment. Most of the complications were pulmonary in character. During the eclamptic stage, special care was taken to cleanse the mouth and throat from mucus and secretions.

Artificial respiration was employed in desperate cases. Cold or hot compresses were applied to the chest to deepen the respirations. Chloral hydrate and morphine were given when required, by rectum. Salt solution was freely used, as indicated.

When the conditions were tabulated for purposes of comparison, it was found that no one type of weather could be described as the peculiar climate of Berlin. The greatest number of cases occurred in May, 1905, 11 cases; December, 1907, 10 cases; April, 1908, 9 cases; April, 1906, October, 1905, September, 1907, March, 1908, 8 cases. The smallest number of cases, one only, occurred in October, 1904, November, 1904, and June, 1906.

If one takes the greatest number of cases in any one month through the four years he finds the largest number in April, 32; in May, 30; the smallest number of cases in any one month, in June and in November, each 16, during the four years.

Comparing summer and winter, one can find no appreciable difference in the occurrence of eclampsia.

In classifying the weather, Schlichting has placed in one group, dry, warm, or clear weather, which ordinarily would not be thought to be favorable for eclampsia. Group second comprises cloudy moist, or stormy weather; group third, unsettled and tempestuous weather.

In twenty-three days he observed 2 cases of eclampsia, and in one day 3 cases of eclampsia developed. In group third, comprising days of precipitation and tempestuous weather, 137 cases developed, and 16 upon days when tempests prevailed, making a total of 153 cases. In group

second, of unsettled weather without distinct storms, there were 67 cases, making a total of 220, with 34 fatal cases, or 84 per cent. of the entire number developing in tempestuous or disturbed weather; 42 cases with 5 deaths, or 16 per cent. of the number occurred on days when the weather was dry, warm, or clear.

The weather which seemed most frequent when eclampsia occurred was either cold, cloudy, with abundant precipitation; or in summer, moist, hot, with a cloudy sky, and often with thunder storms. It is possible that the weather does have some influence in checking elimination, and thus producing eclampsia. It cannot, however, be demonstrated that the weather influences the severity of eclamptic paroxysms.

In a monthly service of 203 to 350 cases of labor, the average number of eclamptics was 5.5. In estimating the influence of climate upon eclampsia, one must also take into consideration those cases of toxemia in which the patients have disturbed nervous systems, but which yield promptly to treatment, and never come to eclampsia. One must also consider the weather for several days preceding the occurrence of eclamptic convulsions.

Eclampsia Neonatorum. Esch¹ refers to several cases of eclampsia in the newborn which have come under his observation.

He considers the eclampsia of the newborn as functional in character, produced by autointoxication. Under these circumstances, and in view of the fact that such cases seem to be rare, a positive diagnosis of eclampsia in the newborn must be made guardedly. Exclusion may enable us to form a positive diagnosis. One must exclude intracranial bleeding, hydrocephalus, and intoxication with morphine given to the mother or through other alkaloidal substances.

Olshausen has shown that when the symptoms of asphyxia are absent in the newborn child, the respiratory movements shallow and infrequent, and the movements of the limbs not coördinated and feeble, if the pupils are contracted and the child cannot be brought to cry by artificial respiration, narcosis with morphine or some other narcotic given to the mother must be suspected. In some cases, coma and convulsions are also observed.

Organic convulsions in the newborn occur with other symptoms of cerebrospinal disease. Unilateral, long-continued convulsions may be considered organic when in the intervals between the convulsions there are anomalies of the pulse and opisthotonos.

The writer refers to a case reported by Weisswanger and Rietschel.² The child was aged eight months, and was demented after birth. Convulsions and tonic contractions were absent. Two weeks after birth an examination of the urine showed hemorrhagic nephritis, which

¹ Zeitschrift f. Geburtshülfe und Gynäkologie, 1909, Band lxxv, Heft 1.

² Münchener med. Wochenschrift, 1909, No. 7.

disappeared in ten days with the subsidence of the cerebral symptoms, and increase in the child's weight. Although active convulsions were absent, the case was diagnosticated as eclampsia of the newborn.

Upon examination after labor, the child had double cephalhematoma, facial paralysis upon the left side, and hematoma in one of the eyes. It could not be definitely made out that some cranial injury was not at the bottom of the condition. The child was born deeply asphyxiated, as the mother had suffered from severe eclampsia. The child was able, however, after birth to suck the bottle, and swallow regularly.

Esch has also reported the case of a primiparous patient admitted to the hospital in an unconscious condition. There was a history of eclampsia, with nine or ten convulsions. The urine was highly albuminous, and contained abundant casts; the child was living, and the cervix uteri admitted one finger, the head standing high above the pelvic brim. The child was immediately delivered by suprasymphyeal section. The mother's recovery was complicated by one brief convulsion, after which she became conscious in six hours.

The mother had no morphine, the child was not subjected to birth pressure in delivery, the mother's convulsions had not been numerous or very severe, and the child at the moment of delivery seemed to be in a normal condition. Twenty-four hours after its birth, it was taken with twitching of the eyelids, nystagmus and a few seconds later with cyanosis and muscular rigidity. Cramp-like movements also occurred. Between these paroxysms the child seemed sleepy and stupid. On the following day, a similar paroxysm, but less severe, occurred. The urine was rich in crystals of uric acid, but contained no casts and no albumin. The child nursed the mother, and made a complete convalescence.

In the literature of the subject, Esch collected 29 cases of eclampsia in the newborn, in all making 32. In 26 cases, the mothers and children had eclampsia, and in 6 cases, the mothers had no convulsions, but had albuminuria.

In studying these cases, accurate examinations of the urine are seldom recorded. In some, albumin, hyaline, and granular casts were found; in one case, Dienst found leucin. This he ascribed to the abnormal action of the liver in the fetus before birth.

Esch does not lay great stress upon the examination of the urine in these cases; Dohrn, in 38 per cent. of the newborn, found albumin in the urine; Hofmeier, in 22 children, found albumin present in the urine in 21. Reusing found casts in the urine in 39.4 per cent. of children nursed by the mothers during the first days of life. Blood corpuscles are frequently found in the urine of the newborn. Eclampsia begins in the newborn by twitching of the eyelids, labored respiration, cyanosis with increased heart action, tonic contractions of the muscles of the trunk, the back, and extremities, while the fingers are drawn into the palms, and the toes are drawn toward the soles of the feet. These conditions

are often varied by clonic spasms. The child is unconscious during the convulsions, but becomes conscious so soon as they cease. After a short time, a stupid and soporose condition develops. Such convulsions may occur in a few moments after birth, or as late as forty-six hours after labor. The duration of the convulsions varies from thirty seconds to ten minutes. The severity of the mother's convulsions seem to have no influence upon the occurrence or the severity of the convulsions in the child. On the contrary, in six cases the mothers had no convulsions, but in other cases the maternal convulsions were very light. Convulsions seemed to develop as frequently in well-developed children at full term as in those prematurely born.

The prognosis is usually bad. Many of the children born from eclamptic mothers are delivered asphyxiated and in a feeble condition. In 234 children born of eclamptic mothers and viable, the mortality was 22.7 per cent., which is a more favorable showing than that reported by other observers. Rigor mortis in children dead born from eclamptic mothers often develops during and after labor, and would indicate that death has been preceded by convulsive movements in the muscles.

Wolff reported 34 cases of rigor mortis in the fetus in utero, of which 8 occurred in children born of eclamptic mothers. The percentage should have been higher if eclampsia alone had produced the rigor mortis, but the most probable explanation lies in the fact that high temperature in the mother produces rigor mortis in the child dying during labor.

So far as treatment of eclampsia in the newborn is concerned, it remains purely symptomatic. Irritation of every source must be avoided. The child should be disturbed as little as possible, the temperature of the room should not be changed suddenly, and a bright light should be excluded. Small doses of bromide and chloral may be given by the bowel. Salt solution may be used hypodermically, warm baths may be given, and various warm fluids described by the writer, as tea made from different sorts of infant foods, may be freely employed.

The reviewer recalls four cases of well-defined toxemia in children born of toxemic and eclamptic mothers. In one case, the mother, a multipara, suffered during the latter months of her pregnancy from obstinate liver insufficiency and overburdened kidneys. She passed through spontaneous parturition without convulsions, but her child developed, within a few days after labor, persistent failure of secretion, dark bloody discharges from the bowels, slight jaundice, convulsive movements, coma, and death.

An autopsy could not be obtained, nor could sufficient urine be collected for examination. The mother subsequently died of interstitial nephritis.

In a second case, the reviewer extracted by postpartum Cesarean section a large vigorous male child at the moment of the mother's death from eclampsia. This child was nourished by a healthy woman in a

maternity hospital and was given every care. Within two weeks it developed scanty secretion of urine, dark greenish and bloody discharges from the bowels, convulsive movements, dryness of the skin, fever, coma, and death.

In a third case, a primipara developed toxemia during pregnancy, and expelled the child prematurely. The mother's toxemia was complicated by thyroid insufficiency, with rapid pulse, and a tendency to exophthalmos. The infant died shortly after birth with the characteristic symptoms of toxemia.

In the fourth case, a multipara, who had had severe scarlatina and nephritis in childhood, developed toxemia in her third pregnancy, and had eclampsia without convulsions. She was suddenly taken with severe vomiting, epigastric pain, rise in pulse tension, and headache. As she had been under eliminative treatment for several days without improvement, delivery was immediately effected with the aid of Bossi's dilator. The infant was viable, breathed apparently normally, and seemed fairly well nourished. It was immediately placed in an incubator. Within two hours it developed typical eclamptic convulsions and died. The mother recovered.

In none of these cases was it possible to obtain autopsies upon the infants, but the symptoms were so characteristic of toxemia and so exactly reproduced those seen in mothers, that it seems fair to consider them as cases of fetal toxemia and eclampsia.

The Time of Labor. Schatz¹ concludes his observations upon the probable time of labor, and the reason for its occurrence. His theory is essentially that each patient has crises in the circulation characterized by a rise in blood pressure, occurring at varying intervals in each individual. The period of blood pressure he considers, on the average, as twenty-one days. He does not, however, believe that labor occurs necessarily at the end or in the middle of the period of average blood pressure. In angioneurotic patients, he finds that labor occurs on the day corresponding to that of the last menstruation in which, in the early months of menstruation, conception had probably occurred. He does not find that there is necessarily a correspondence between the type of menstruation and the periodicity of pregnancy. A difference of five or six days can be observed between these types, and blood pressure is considered a more important phenomenon than the actual occurrence of menstruation.

Missed Abortion. Rosinski² reports the case of a woman infected with syphilis who had an abortion accompanied by severe bleeding. She recovered from this, and pregnancy again occurred, accompanied by albuminuria, edema, and a generally run-down condition. Symptoms of threatened eclampsia occurred at the third month of gestation, with

¹ Archiv f. Gynäkologie, 1909, Band lxxxvii, Heft 3.

² Monatsschrift f. Geburtshilfe und Gynäkologie, 1908, Band xxviii, Heft 2.

partial dilatation of the cervix. Convulsions and coma developed, followed by death.

The fetus was born in a macerated condition, and had reached the fourth month of development, having been retained in the uterus for three months after its death without abortion.

The second case was that of a multipara who had felt the movements of the child, which gradually ceased. The abdomen became smaller, the breasts contained a thin milky secretion, and the death of the fetus was diagnosed. The patient was very anemic, with edema of the lower extremities. There was considerable albuminuria.

Upon examination, it was thought that interstitial pregnancy was present, or pregnancy in a rudimentary uterine cornu. Uterine contractions developed, followed after some hours by the expulsion of the fetus and its membranes, the placenta being retained. This was gradually delivered, followed by profuse hemorrhage, which was repeated and which greatly complicated the prolonged puerperal period. In both these cases, missed abortion was present. In the last, signs of mummification were observed, the placenta was thick, hardened, resisted the knife upon cutting, and had undoubted postpartum changes which had developed some time previous to its expulsion. The ovum had become a foreign body without being expelled from the womb. The entire ovum had become a solid body, evidently compressed by the gradual contractions of the uterus.

Fatal Hemorrhage following Abortion at the Fourth Month. Henze¹ reports the case of a multipara, aged forty-four years, four months pregnant, who had daily uterine hemorrhage for eight weeks, becoming severe for the last two weeks. She had become very anemic and greatly exhausted. A laminaria tent was placed in the cervix, and under chloroform narcosis the uterus was easily emptied. Bleeding occurred which could not be controlled by massage, hot irrigations, and tamponing of the uterus. When brought to the hospital, the tampon was renewed, salt solution was injected, and these measures failing to check the hemorrhage, the uterus was removed through the vagina. But nine minutes were occupied in the operation, and clamps were employed. There was no bleeding during the operation. The patient could not be resuscitated, and died shortly after.

Upon examining the uterus, it was developed normally, with apparently normal muscle, and was without wound or injury. Upon microscopic examination, the muscle fibers were normal and the decidua was normal. No cause but pernicious anemia could be ascribed for the result.

Adrenalin in the Treatment of Hemorrhage following Abortion. Grasser² reports the case of a multipara, aged thirty-six years, who had had an

¹ Zentralblatt f. Gynäkologie, 1908, No. 29.

² Ibid., 1909, No. 25.

incomplete abortion, after which the placenta was removed under anesthesia. Tamponing and injections of ergotin had failed to check the resulting hemorrhage. In spite of stimulation, the radial pulse could not be obtained, and the vagina was filled with clotted blood. The tampons were removed and the vagina cleansed, the uterus thoroughly packed with iodoform gauze strips, and an injection of salt solution given containing from 30 to 40 drops of 1 to 1000 adrenalin solution. The tampon remained in place two hours, during which the patient was transfused with salt solution. Upon removing the tampon, the cervix was pale, empty of blood, seeming like connective tissue, and hard. Upon grasping it with tenaculum forceps, there was no hemorrhage, and no further bleeding occurred. A small quantity of dirty brown fluid subsequently escaped.

In another case, the writer employed three drops of 1 to 1000 adrenalin solution to one cubic centimeter of salt solution, or 1 per cent. solution of cocaine. The bleeding ceased in ten minutes with the same phenomena. This was injected into the cervix.

The writer recommends for trial, one cubic centimeter of a one per cent. solution, or two cubic centimeters of 0.5 per cent. solution of cocaine containing three drops of 1 to 1000 adrenalin solution injected on the right and left sides of the anterior and posterior surfaces in the vaginal portion of the cervix; from one to two centimeters into the tissue. In ten minutes time the bleeding ceases and the operator could proceed to empty the womb or to tampon it, as he desired.

The Abortion Forceps. Hammerschlag¹ enters a plea for the use of the abortion or placental forceps in terminating inevitable abortion. He calls attention to the danger in the use of the curette and the tenaculum forceps, and cites cases in which the cervix was badly lacerated, the uterus perforated, and a piece of mucous membrane from the intestine torn off. In one case, two doctors using placental forceps had removed two and a half centimeters of the mucous membrane from the bowel. In another case in which the placental forceps, with sharp edges, was used, the wall of the uterus was perforated and a loop of intestine withdrawn to the vulva. In another case, a piece of uterine muscle was seized with the instrument and torn away, creating a perforation. In still another case, the uterus was perforated and a piece of mesentery withdrawn.

These accidents all happened with sharp-edged placental or abortion forceps, which readily perforate the womb. A safe instrument is very blunt at the extremity, with blunt and smoothly rounded edges, and should always be used under the guidance of the examining finger. The finger should detect adherent portions of the appendages of the ovum and guide the forceps in their grasp of the material to be removed.

With these precautions it is thought that the use of the abortion or

¹ Zentralblatt f. Gynäkologie, 1908, No. 17.

placental forceps may in many cases be safer than the employment of the curette. Certainly the sharp curette should never be used in terminating incomplete abortion.

LABOR AND ITS COMPLICATIONS.

The Influence of Labor upon the Pelvic Floor and Levator Muscles. Pankow¹ draws attention to the writings of Tandler and Halban, whose anatomical researches have shown that the levator ani muscle plays an important part in preventing prolapse, and that overdistention and injury to the muscle are of primary importance in producing dislocation of the genital viscera.

The question naturally arises as to what degree of distention or injury to this muscle is followed by pathological conditions. If parturient patients are examined upon their recovery from labor, it is found that not only is the muscle increased in width by distention, but also that this alteration in form is better developed upon one side than upon the other, and that from this results the fact that the contractions of the halves of the muscle are not identical. During labor it is seen that the pressure of the obturator internus muscle upon the occiput is greater upon one side than upon the other. As the head descends, the entire pelvic floor is distended and the levator ani muscle is involved. The posterior segment of the pelvic floor is composed of strong muscular tissue, while the two lateral portions of the muscle are of weaker fiber and more easily lacerated and distended.

Experience shows that the central and stronger portion which bears the greater part in rotating the occiput anteriorly, often resists pressure more successfully than the lateral portions, which are less well developed. Clinical observation demonstrates that in cases where labor occurs in vertex presentation first position, the left portion of the lateral levator muscle is more greatly distended and loses more of its functional power than the muscle upon the right side. So true is this that a diagnosis of the preceding mechanism of labor in vertex presentation can be made by a study of the conditions in these muscles.

Pankow has examined 180 women, each of whom had borne one child. In 43, he could make no diagnosis of the preceding mechanism of labor by this examination, as the lateral portions of the levator muscle were alike on both sides. In 21 cases, he made a mistaken diagnosis, as involution had proceeded to such a degree that no distinct difference was present. In 116 cases, the correct diagnosis was made by this examination.

In examining patients who have never borne children, it is found that

¹ Zentralblatt f. Gynäkologie, 1909, No. 29.

the two sides of this muscle often differ in development. The difference, however, is slight. In the mid-region between the symphysis and the spine of the ischium, the lateral muscle is at least one or two fingers in breadth. This is best ascertained by raising the pelvis of the patient during examination. If the patient makes an effort to contract the muscle, as if endeavoring to retain fecal matter in the bowel, the examination is facilitated. One can readily understand that if the elasticity of the levator ani muscle is normal, and the patient's muscular tissue is in good condition, and the circumference of the head not too great, the muscle may regain its tone so quickly after labor that it would be difficult to assert that parturition had occurred. Usually, however, such distention and laceration results that the diagnosis of preceding labor is not difficult.

Such alterations in the muscle are naturally least after spontaneous birth of normal duration. Such distention usually is greatest in the anterior portion of the levator lateral muscle. On the side upon which the vertex pressed in labor, the muscle does not extend as far as normal anteriorly; the anterior portion seems to be more narrow and plainly to be discerned by vaginal examination. In rare cases, the muscular tissue seems to have disappeared in this location and to be replaced by firm connective tissue. As this has no contractive power, deformity results. In such cases, the danger of laceration is greater than if the muscle had retained its integrity. Where the head is very large, its passage produces an injury to the substance of both lateral muscles, which is greater upon the side toward which the occiput is directed. In multiparæ, atrophy occurs, and diastasis develops. In these cases the lateral levator muscles are recognized as relaxed strands of muscular fiber varying in size and vigor, but contracting poorly. As in these cases the urogenital diaphragm has been greatly injured, the tendency to prolapse is evident. These abnormal conditions are greater in cases where the head remains for a long time at the pelvic outlet.

If an effort be made to observe the results of operative delivery, it is found that the judicious use of the forceps does not produce injuries greater than spontaneous labor, but, on the contrary, tends to preserve the parts in better condition. When, however, the forceps is applied to produce rotation of the head, greater injury results.

Scanzoni reports a case in which, after such use of the forceps, the lateral levator muscles were so injured and atrophied that there was scarcely any muscular tissue remaining. Upon the patient's discharge from the hospital, nothing but scar tissue could be found in this region. A similar result followed two applications of the forceps upon the head in the pelvic brim, descent failing. Both of these patients were primiparæ with moderately contracted pelvis. In these cases, the rotation of the head is affected while the levator lateral muscles are in a condition of greatest distention.

For these reasons, it is best, whenever possible, to rotate the head by the hand when delay occurs with transverse position of the head. If considerable danger to the child arises during labor, and the chance of preserving the life of the fetus is small, it would be better in the mother's interest to perform embryotomy. In the case of a primipara above the average age, with rigid tissues, it might even be better to perform cervical Cesarean section, although the risk of laceration after this operation is considerable.

After hebotomy, the danger of overdistention and injury to the lateral levator muscles is very great. In 9 cases recently examined, cystocele was found in 3, in 2 of whom prolapse of the uterus was also present. In 2 cases, the lateral levator muscles were completely ruptured upon each side, and in 1 case upon the sides on which the pelvis had been opened. In all the other cases, the levator muscles were most stretched and injured, not upon the side toward which the vertex was directed, but upon the side corresponding to the incision in the pelvis. Upon the opposite side was found either no alteration in the levator muscle, or a slight laceration and scar formation in the anterior portion of the muscle. In these cases cystocele was present in two.

It is evident, that in all cases in which the pelvic girdle is opened, the urogenital diaphragm stands in the greatest danger of injury, and that the formation of cystocele is almost inevitable. In all these cases spontaneous labor was waited for and expected after hebotomy.

In cases where, after hebotomy, labor is terminated by version and extraction, or the use of forceps, the injury must be greater. Such injuries form an argument against the frequent performance of hebotomy.

In reviewing the subject, it is found that spontaneous parturition often injures the anterior attachments of the lateral levator muscles by the pressure of the vertex rotating anteriorly. Upon the opposite side, the muscle may remain intact or be but slightly injured, with slight formation of scar tissue. In multiparæ, atrophy and relaxation of the anterior portion of these muscles is a frequent result. The use of the forceps is safest in which the head is not rotated in the grasp of the instrument, and in which the instrument serves as a tractor only.

These muscular injuries are attended by the extravasation of blood and relaxation of muscular fibers. It can scarcely be expected that an exact return to the condition present before labor can occur in these cases no matter what form of operation be done secondarily. So much atrophy and relaxation is present than one can only hope for moderately good results.

The writer calls special attention to the importance of rotating the head with the hand, rather than with the forceps, when the indications arise for forceps delivery. Where rotation has occurred, and the sagittal suture occupies the median line of the pelvic floor, delivery by forceps will result in less laceration and distention of muscle than with long-

continued birth pressure. The fact that hebotomy is frequently accompanied by severe injuries of this sort should lead to the more frequent choice of Cesarean section.

In this connection, the reviewer desires to call attention to the importance of immediately closing lateral injuries to the pelvic floor occurring during labor. If forceps delivery be conducted under competent anesthesia, with the necessary accessories for surgical operations, it is often possible to detect such injuries and to immediately suture them. In my experience, excellent results have followed, and I have seen these cases recover without the atrophy and distention of the lateral levator muscles described by the writer.

I fully agree with the writer in his belief that the prompt extraction of the head after rotation has occurred is followed by less injury than by prolonged birth pressure.

The Sequelæ of Present-day Labor. Polak¹ calls attention to the fact that obstetrics, as practised by the rank and file of the profession is little better now than twenty-years ago. Asepsis and antisepsis have given the ignorant and conscienceless more courage to interfere, so that while the maternal mortality is less, morbidity is greater. Patients frequently survive labor in ill health which cannot be remedied.

Attention is called to the danger of artificially dilating the birth canal, whether the hand, the hydrostatic bag, or steel dilator be employed. Artificial rupture of the membranes before complete dilatation is also productive of danger. Cervical injuries are inevitable in artificial dilatation of whatever sort; in forceps application before the cervix has retracted, and in dry labor. Chronic infection, although not severe, often becomes permanent after such delivery. Lacerations of the cervix are frequently neglected, and are not closed until they have had their effect in producing subinvolution.

In 500 patients examined in private practice, retroversion was found on the tenth day of the puerperal period in 43; between the fourth and sixth week after delivery, in 231; in 203, the uterus was movable, and could readily be replaced and retained by a suitable pessary; in 28, the womb could not be retained by a pessary, and the patients passed from observation with retroversion.

Metrorrhagia in the puerperal period is a significant symptom of involution, often preceding thrombosis in phlebitis. Normal involution of the uterus occupies from four to twelve weeks, and during this time retroversion, uterophlebitis, and inflammatory changes in the pelvis may develop. This is especially true after abortion.

The conduct of labor should aim to avoid traumatism and laceration, infection, incomplete emptying of the womb, and its chronic relaxation. To secure thorough dilatation, an elastic bag placed in the vagina is

¹ American Journal of Obstetrics, December, 1909.

often of advantage. This preserves the membranes, assisting in dilatation of the cervix and prepares the patient for the passage of the head.

The short Champetier bag is selected, fitting the curves of the patient, and having a circumference practically that of the suboccipitobregmatic diameter of the head. If this bag should be introduced carefully and slowly inflated, but little pain is produced, and labor pains become expulsive. Lacerations of the cervix may be immediately closed when hemorrhage is present. When hemorrhage is absent, operation forty-eight hours after delivery gives good results. Anesthesia and competent assistants are necessary. Sterile chromic catgut may be used in the cervix and in the anterior vaginal wall; silkworm gut and silver wire in the pelvic floor.

To avoid infection, infrequent vaginal examinations, sterile rubber gloves, complete emptying of the womb, and large doses of ergot are indicated. During the puerperal period the patient should change her position frequently, the elevated trunk posture being used in patients with pelvic infection, to empty the vagina of clots and localize the infection.

The patient may sit up out of bed when the fundus is on the level of the pelvic brim. Before resuming the recumbent posture the patient should assume the knee-chest posture for several months. Hot sterile vaginal douches are begun when the lochia becomes white, one to two gallons of water at from 166° to 120° F. being used. If it is necessary to empty the uterus with the finger, the curette or forceps should be carried high in the pelvis, afterward in anteflexion, and retained in this position by a vaginal support of gauze. Cases of puerperal hemorrhage call for digital exploration of the pelvis and for the appropriate treatment of whatever condition may be present.

In displacements, the curve of the uterus should be straightened by digital manipulation, in the knee-chest posture, with a tampon of sterile or iodoform gauze. When this is introduced or removed, the patient should be placed in the knee-chest posture. Sterile wool tampons with boroglyceride may be used in the latter weeks of the puerperal period. A hard pessary should not be applied before the sixth week, but if this gives comfort, it may be worn for several months. In cases where hemorrhage follows the dislodgement of clots at the placental site, the uterus should be tamponed under antiseptic precautions with iodoform gauze. To avoid the vesical complications of the puerperal stage, no obstetric operation should be done, except after thoroughly emptying the urinary bladder. Full dilatation of the cervix and proper axis traction prevent injury to the bladder. After labor, the bladder should be promptly emptied at regular intervals.

Rupture of the Uterus during Labor. Lobenstine¹ reports from the New York Lying-in Hospital, in 60,000 confinements, 46 cases of

¹ American Journal of Obstetrics, November, 1909.

complete rupture of the uterus, 29 of incomplete rupture, and 3 of rupture of the vaginal vault, without actual laceration of the uterus.

Of the complete ruptures, 44 occurred in multiparæ and 5 in primiparæ, of whom 3 had also rupture of the vaginal vault. Of the incomplete lacerations, there were 11 multiparæ and 18 primiparæ. In the 78 cases, there was 1 case of hydrocephalus.

The 46 cases of complete rupture are divided into spontaneous, traumatic, and ruptures due both to version and transverse presentation. Among the first, pelvic contraction was present in 21 cases; scar tissue after Cesarean section in 2; scar tissue after amputation of the cervix in 1; transverse presentation in 3; and hydrocephalus in 1.

In the traumatic ruptures, there were 3 following high forceps; 5 after podalic version; 6 after forcible labor; 1 after embryotomy. There were 3 cases of rupture due both to version and transverse presentation.

Two types of complete rupture may be recognized—transverse and longitudinal. In the former, with the anterior uterine wall, the bladder is often injured. When the rupture is longitudinal, in severe cases, the uterine vessels on the side of the tear and the broad ligaments, are damaged. Intrauterine manipulation most often produces longitudinal rupture, and spontaneous labor transverse tears.

In the series, there were 26 starting as vertical ruptures, 18 on the left side, 2 in the middle, and 6 on the right. In the transverse ruptures, there were 13 on the anterior wall, and 7 on the posterior. Most of the cases showed more or less fusion of these types. Rupture through the fundus occurred but three times, in two cases in Cesarean scars.

It is thought that the imprisonment of the lower portion of the cervix between the presenting part and the pelvic brim, acts largely in producing spontaneous rupture. When the tissues are drawn tightly over the head, the vaginal vault is also torn.

In noting the symptoms of this condition, it was observed that the uterus was more often large, flabby, and boggy. Pronounced shock soon developed, and death occurred frequently within a few hours from shock and hemorrhage. If the patient survived for some time she perished from septic infection. Where rupture occurs after Cesarean section, or very early in labor, there are usually no premonitory symptoms. In cases where there is great distention in the lower uterine segment, the vaginal vault is drawn upward and thins to the point of rupture. If this does not occur, it is because the lower zone is protected by the round ligaments and the broad ligaments.

Incomplete rupture may occur in any portion of the uterus; it is usually a longitudinal laceration through one side of the cervix, the lateral vaginal fornix, and up into the broad ligament. In severe cases the lower uterine segment is involved and the vessels are often injured.

The next most common type of incomplete rupture is transverse through the cervix into the uterovesical space. Incomplete lacerations

higher up are not as serious and less common. Rapid artificial dilatation of the cervix is the most common cause of incomplete rupture. The use of Bossi's dilator to its full extent frequently results in this accident. Dilatation for central placenta prævia furnishes the greatest number of cases. Where delivery by version and extraction follows, the tear is begun during dilatation and extended by the after-coming head. In five cases, the rupture was caused by hasty delivery for violent accidental hemorrhage. Old scar tissue in the cervix or vaginal vault is the most frequent cause of partial rupture in spontaneous labor.

In complete ruptures, the mortality was 73.9 per cent.; in ruptures of the vaginal vault and uterus, the mortality was $33\frac{1}{3}$ per cent.; and in incomplete ruptures of the uterus, the mortality was 27.5 per cent. The mortality of the 78 cases was 53.8 per cent. Those patients dying with incomplete rupture of the uterus were suffering from central placenta prævia or eclampsia—which in themselves have a high mortality.

The fetal mortality in complete rupture was 83 per cent.; in rupture of the vaginal vault, 66.6 per cent.; in incomplete rupture, 52 per cent.—making a total fetal mortality of 70 plus per cent.

To prevent this accident the patient's physical condition should be made as good as possible and abnormalities promptly recognized. Prolonged dry labor is dangerous, especially the prolonged second stage, with violent uterine contraction. In artificial dilatation of the cervix, great care must be exercised. The uterus in tonic contraction forbids an attempt at version. If the rigid brim of the cervix is present the forceps must not be applied. Patients who have had Cesarean section should be warned of this danger in a subsequent pregnancy when labor begins, and should have proper medical supervision. The symptoms of threatened uterine rupture should be kept in mind in all cases of parturition, and delivery promptly effected in the safest manner for the mother. After rupture, when the vaginal vault is torn, the use of the gauze tampon with or without sutures is usually successful. Should the intestines or omentum prolapse, abdominal section must be performed immediately, and the laceration closed if possible. When the uterus is considerably separated from the vagina it must be removed.

In incomplete rupture, firm tamponing, with or without sutures, is successful in nearly all cases. Should hemorrhage persist, section is indicated. Pressure from above, after the use of the tampon for several hours, is of value. In some cases pressure upon the abdominal aorta is indicated to lessen the blood supply from the pelvis. Where the incomplete tear opens into the broad ligament, without involving the lower section of the cervix, it may be impossible to apply a tampon at the point of laceration. In these cases the uterus and vagina must be tamponed and counterpressure exerted from above. Should hematoma form in the broad ligament, it may require opening from above or from below subsequently.

In complete rupture, immediate delivery is indicated if the child be still in the womb. If the circumstances are favorable for immediate section without transference to hospital, this should be performed. If this is not feasible, tight tamponing of the uterus and vagina will give better results than the removal of the patient. In these cases severe shock and hemorrhage make the transference of the patient a dangerous thing.

When the diagnosis of complete rupture is made early, and the rupture is not extensive, and the child still within the uterus, if the child is alive and the mother in good condition, she may be taken carefully to hospital and immediate section performed.

If the child is dead and the mother in fairly good condition, delivery should at once be accomplished in the simplest manner, and the rupture treated by the use of the tampon. If section can be immediately performed, it should be done without transfer. If the conditions are such that operation cannot be done in the patient's home, the case should be taken to the hospital before the child is delivered. This is to avoid the shock and hemorrhage and increasing tear produced by the delivery. If the child and placenta have escaped from the uterus into the abdominal cavity, section is necessary. In extreme shock this should be done without transfer.

When the diagnosis of rupture is first made after the delivery of the child, the rupture not extensive, and shock and hemorrhage are not great, a carefully applied tampon, with partial suture, will often give good results. In performing section, the child and placenta having been removed, the peritoneal cavity may be irrigated and drained through the laceration. If the conditions are favorable an attempt may be made to close the laceration; or, if the tear be extensive, hysterectomy and drainage from below should be performed.

In 29 cases operated upon, the mortality was 62 per cent. In discussing the choice between section and the use of the tampon and drainage, section will give the best results, except in clean cases with small lacerations when hemorrhage is promptly controlled by a tampon, and in bad cases with pronounced shock. It is of the utmost importance that such cases be seen as soon as possible after the accident has happened, and that operation be promptly performed.

The Role of the Perineal Body in Labor. Paramore,¹ in a paper read before the Obstetrical Section of the Royal Society of Medicine, stated that the perineal body plays no part in the support of the viscera, nor did its rupture facilitate prolapse. He believed, however, that the perineal body exercised a far-reaching influence during labor, which was not necessary nor good. As the fetal head descends, the pelvic floor becomes a broad gutter-like declivity, at the lower end of which is found

¹ British Medical Journal, February, 6 1909.

the posterior puborectalis muscle. The dilatation of the anus and the increase in the length of the base of the perineal body shows the degree to which the pelvic floor is stretched. The tension of these perineal tissues determines the forward projection of the anterior segment of the head, as the head is ovoidal. If the vulvar aperture is destroyed by lacerations, the forward movement of the anterior segment of the head does not occur.

It seems evident that a perineal tear, by allowing birth with the least possible tension of the muscle, might in some cases prevent an injury which would predispose to prolapse. When they do not involve the sphincter the perineal tears are trifling injuries, and the only reasons for suturing them are to prevent infection and check hemorrhage. The main mass of the pelvic floor passes behind the anal canal and remains intact in spite of the perineal tear. When the head appears at the vulva, its continued extension may be prevented by placing two fingers between the head and the pubis and exerting traction backward. The head may also be pressed downward and forward from above the anus by simultaneous pressure.

The Spontaneous Cure of Rectovaginal Lacerations Produced in Labor.

Jeannin¹ reports the case of a woman in her second pregnancy, whose first pregnancy had terminated in the expulsion of a macerated fetus. The second labor at term proceeded regularly with complete dilatation and spontaneous rupture of the membranes. Uterine inertia developed and the head was delivered with great ease by the Tarnier forceps. In delivery the rectovaginal septum was perforated by the shoulder of the child, which was a large male.

Upon examination the perineum was intact and the vulva uninjured. Upon the posterior vaginal wall there was a considerable solution of continuity, admitting three fingers. The surroundings were not favorable for surgical interference, and instructions were given to bring the patient to the Tarnier clinic on the following morning. These directions were not obeyed, and nothing was heard of the case for ten days. At that time the midwife who had been in attendance reported that the lacerations had healed spontaneously. Upon examination this proved to be true, and an injection of fluid containing gas showed that no leakage was present between the two cavities. The midwife had given vaginal douches night and morning, and had applied tincture of iodide as well as she could to the vaginal tissues.

There had been considerable constipation for the first week after delivery, which terminated in the expulsion of hard fecal masses on the ninth day. On the fifteenth day, cicatrization was found to be complete.

Bar reports a similar case where, after forceps delivery, a rectovaginal fistula was found, which healed spontaneously in eight days after labor.

¹ *L'Obstétrique*, April, 1909.

Four other cases are collected from the literature in which such lacerations closed spontaneously with the production of scar tissue. The possibility of this result, however, does not lessen the obligation upon the obstetrician, who ought immediately to insert stitches in these cases, to make sure of primary union.

Spontaneous Rupture of the Umbilical Cord during Labor. Semon¹ draws attention to the statistics regarding spontaneous rupture of the umbilical cord during labor. In the Stockholm clinic, Forsell found but two cases in 14,639 births. In abnormally rapid labors, with the patient in the standing or partially erect posture, Winckel estimates that rupture of the cord occurs in 19 per cent.; Beyer, in 14 per cent.; Hellnake, in 34 per cent.

Evidently, two elements must have been present to produce this result—abnormally sudden and vigorous expulsive force, and an unusual weakness in the tissues of the cord. This is not only seen in premature and macerated fetuses, but sometimes in the living child at full term. During obstetric operations for complicated labor, rupture of the cord may also occur. This accident may even happen in spontaneous labor during the period of dilatation, as in a case reported by Funke.² Microscopic examination in these cases shows a lack of development in the elastic tissue surrounding the vessels, especially in the tunica media. This explains the clinical fact that cords containing varices are especially apt to rupture spontaneously. Partial rupture and laceration of the vessels is not infrequent, especially in velamentous insertion of the cord.

Semon reports the case of a primipara, aged twenty-four years, who, during her first pregnancy, suffered from gonorrhea. In the second pregnancy, colpitis was again present. The mechanism of labor was normal until the membranes ruptured when visible in the vulva. The amniotic liquid was in normal quantity and clear. The birth of the child followed immediately, and with it came the ruptured cord 32 cm. in length. The cord was immediately clamped, but it was impossible to find the placental end, and bleeding occurred. The placenta was immediately expressed and the uterus massaged, when bleeding ceased. Upon delivery, the placenta and membranes were intact, when it was found that the cord did not terminate in the placenta but passed along the membranes to the edge of their insertion in the placenta. There were no spirals in the cord, and the lumen of both arteries and veins could be plainly recognized. The edges of the lacerated surfaces seemed to be perfectly smooth. In these cases, immediate delivery should be accomplished, and the cord clamped and tied. The mother's hemorrhage calls for the prompt expression of the placenta.

Unterberger³ reports two cases of this accident. The first occurred in the mother's second labor, the pelvis being very slightly contracted,

¹ Zentralblatt f. Gynäkologie, 1909, No. 40.

² Ibid., 1901, No. 21.

³ Ibid., 1909, No. 14.

vertex presentation, second position. The uterus contracted very strongly during the period of expulsion, and the cord was wrapped twice around the neck of the child. Immediately after the birth of the head, the shoulders and body of the child were forced out by strong, expulsive efforts. The cord ruptured 22 cm. from the child's navel, and both ends were immediately caught and ligated. There was no hemorrhage from the cord, and the placenta was soon delivered. The child was above the average in weight and vigor. The placenta contained much calcareous matter and a small infarct. There were no signs of syphilis. The cord was 47 cm. long, and contained abundant Wharton's jelly. At the point of rupture, both umbilical arteries projected somewhat from the stump.

The second case was that of a primipara, aged nineteen years, with slightly contracted pelvis. The cord was once about the neck of the child, and could not be dislodged. So soon as the head was born, the shoulders were pressed outward by a strong expulsive contraction, with rupture of the cord 10 cm. from the child's umbilicus. It was observed that first the sheath of amnion ruptured on the convex side of the cord, where it was wrapped about the child; then both umbilical arteries tore; and finally the vein, the rupture of the cord permitting the immediate birth of the shoulders.

Upon examining the cord, it was found that the sheath of amnion was still present on the concave side of the coil of the cord. The rupture was oblique and with ragged edges. The arteries retracted, but the irregular margins of the vein remained evident. Both ends of the severed cord were immediately tied and there was no hemorrhage. The cord was 50 cm. long, with few spirals, and contained little jelly. The child, a female, was 52 cm. long, and of average weight.

No anatomical cause for this accident, in both of these cases, could be found. There were no varices in the cords, and microscopic examination of the vessels showed that the elastic fibers of the vessels were normal in size and development. Sudden strong expulsive efforts, with sudden uterine contractions, and the coiling of the cord, were thought to be the causes of the accident.

Fetal Mortality during Labor, not including Pelvic Deformity. Marx¹ draws attention to conservative methods for preventing fetal mortality during labor. He urges that operations should not be undertaken without signs of beginning maternal exhaustion, or evidence that the fetal life is in danger. Abnormal presentations are a frequent cause of fetal mortality in labor, and efforts should be made early in labor to correct them. If version is performed, delivery should be effected with as little traction as possible, utilizing suprapubic pressure. Forceps should be applied as low in the pelvis as possible; the high application of

¹ American Journal of Obstetrics, February, 1909.

forceps should be avoided. In moderate disproportion, version before the membranes rupture is useful, as is Walcher's position during delivery. In private practice, embryotomy should be promptly undertaken when it is evident that the child is dead or dying. Pubiotomy may not be selected as a child-saving operation, as its fetal mortality is from 6 to 12 per cent. Cesarean section, on the contrary, offers the best chance for the child. Abnormalities in the action of the uterus and in the mechanism of labor are a frequent cause of fetal mortality. In neurotic and spastic conditions, quinine as a tonic and chloral as a sedative are valuable. Opium is an excellent drug to prevent exhaustion. In polyhydramnios, early rupture of the membranes is useful.

To prevent prolapse of the cord and fetal death, version should be performed early. With a shortened cord, shown by irregularity in the heart's action and persistent souffle, an attempt may be made to shorten the birth canal by prolapsing the uterus with firm abdominal pressure. The fetus should be delivered as soon as possible. The os should be thoroughly and early dilated by artificial means, if necessary.

In eclampsia, accidental hemorrhage, and placenta prævia, speedy delivery gives the infant its only chance. Vaginal Cesarean section may be useful in some of these cases. Care must be taken not to attempt rapid vaginal delivery until the birth canal has been fully dilated. Indirectly, fibromata and ovarian tumors complicating pregnancy should receive prompt attention, thereby lessening fetal mortality during labor.

PLACENTA PRÆVIA.

The Treatment of Placenta Prævia by Elastic Bags. Zimmermann¹ has treated 28 cases of placenta prævia, from the thirty-sixth to the fortieth week of gestation, in which the membranes were unruptured and the child was living when the cases were seen. It was possible in all of these cases to perforate the placenta and introduce an elastic bag into the uterus to perform dilatation. All the mothers and all the children in this series recovered.

Krönig² believes that the use of the elastic bag in placenta prævia has reduced fetal mortality somewhat, but has not materially lessened maternal mortality. He does not believe that the hemorrhage can be better controlled by the elastic bag than by the tampon, or by the body of the child. The bag is often suddenly expelled from the uterus followed by severe hemorrhage which can only be controlled by bringing the body of the child quickly into the cervix. Postpartum hemorrhage is quite as apt to occur with the use of the bag as by other methods.

He draws attention to the results obtained at Greifswald by this method of treatment. In 28 cases of placenta prævia, 19 were treated

¹ Zentralblatt f. Gynäkologie, 1909, No. 10.

² Ibid., No. 34.

by the use of the elastic bag. Of these, four mothers died—a mortality of 21 per cent.; three of them died of hemorrhage; one two weeks after labor from septic infection; one of these patients lost 1600 c.c. of blood after coming under treatment.

In these 19 cases the bag was forced out in 6, followed by severe hemorrhage; in 8, there was severe postpartum hemorrhage, with uterine atony.

Krönig has collected the statistics of 6569 cases of placenta prævia with a maternal mortality of 9.3 per cent., and a fetal mortality of 58.7 per cent.; 1602 cases were treated by version and bringing down of the breech, with a maternal mortality of 6.26 per cent.; fetal mortality, 58.9 per cent.; 380 cases were treated with the use of the elastic bag, with a maternal mortality of 6 per cent.; fetal mortality, 33 per cent.

Hannes reports a maternal mortality of 5.5 per cent., and fetal mortality of 55 per cent., by the use of the elastic bag. Richter, in Leopold's clinic, has obtained good results, but states that the use of the elastic bag is often successful, but not so favorable for the mother as version and the bringing down of the body of the child. The use of the elastic bag is attended with a maternal mortality ranging from 5 to 7 per cent., and a fetal mortality of 50 to 70 per cent.

In the *Zentralblatt f. Gynäkologie*, 1909, No. 15, Krönig publishes notes of 20 cases of placenta prævia, in 18 of which he relied upon version to control the hemorrhage, and with good success. In one of these cases, an elastic bag had been introduced through the placenta, but had failed to check the bleeding. In another case the elastic bag was introduced, but was spontaneously expelled, followed by the birth of the child. One of these patients died of hemorrhage during labor. The remainder had their most critical time from one to two hours after the delivery of the placenta, when secondary shock and collapse developed.

In all, there were four deaths from hemorrhage and one from sepsis, during the puerperal-period.

The hemorrhage seemed more severe in proportion with the period of gestation. The further advanced the gestation was at the time of delivery the greater the danger of fatal hemorrhage. In 34 cases which he has collected there was bleeding before labor in all, sufficient to call attention to the gravity of the complication.

The Treatment and Prognosis of Placenta Prævia. Richter¹ reports 83 cases of placenta prævia in Leopold's clinic among 4624 labors. In these cases the fetus was at full term in 33, and of these 22 were discharged living and in good condition. One-third of the number perished during or immediately after the labor. The remaining 50 children were those whose life would have been very uncertain without the complication of placenta prævia.

¹ *Zentralblatt f. Gynäkologie*, 1909, No. 22.

All experience shows that the pregnant patient who has had severe hemorrhage should be immediately delivered, as one can never tell how soon or how violently the hemorrhage will recur. In 29 per cent. of the cases it was sufficient to rupture the membranes. Labor developed and hemorrhage ceased. If the circumstances seemed favorable for the birth of a living viable child, an elastic bag was used. In 11 cases, 5 children were born living and 6 died. The bag is more dangerous than version and extraction, and must be used with great caution. It must be inserted immediately after the rupture of the membranes and so adjusted as to make pressure upon the various portions of the placenta, forcing the placenta against the cervix and sides of the pelvis. Caution must be exercised in making traction upon the bag to avoid lacerations of the cervix. It must not remain in place too long, as it produces bruising of the cervix and favors infection. If the bag is not efficient in producing labor in from four to six hours, version should be performed. In 9 cases treated by the bag it was necessary to complete delivery by version, and in these cases the greater number of children perished. In 22 cases version was performed with the birth of 3 living and 19 dead children. In the series of 83 patients, 47 per cent. of the children were born living and 53 per cent. dead.

As regards the mothers, one only of the 83 died as the result of operative interference. This patient was admitted to the hospital severely infected.

The morbidity of the mothers was not excessively high; 73.5 per cent. were without fever in the puerperal period, although 23 of these had been treated by the tampon; 22 cases, or 26.5 per cent., had abnormal puerperal periods; 11 with severe rise of temperature, and 18 with convalescence extended to 61, 73, and 119 days. Of these last, 3 had thrombosis.

The danger of hemorrhage in the puerperal period is considerable, and in the 83 cases there were 9 suffering from moderate postpartum hemorrhage; one with severe hemorrhage following lacerations of the cervix; and one that went into severe collapse.

Placenta Prævia with Cesarean Section. Calzolari¹ reports a case of placenta prævia for which he performed Cesarean section, with a favorable result. The patient's convalescence was retarded by thrombosis of the iliac veins.

The Treatment of Placenta Prævia. Schauta² in 54,000 births in eighteen years had in the hospital 438 cases of placenta prævia with a maternal mortality of 7.1 per cent. Of the 31 cases dying, 26 had been examined before they entered the hospital and but 5 were clean cases. The mortality of the children was 57.3 per cent. There were 88 cases of central placenta prævia, of whom 25 had not been examined before

¹ *Annali di Ostetricia*, August, 1909.

² *Monatsschrift f. Geburtshülfe und Gynäkologie*, 1909, Band xxx, Heft 3.

admission, and were therefore reckoned as clean cases. Of these, 4 died of hemorrhage, as they were admitted exsanguinated.

Obviously, Cesarean section was not indicated upon women admitted in a practically bloodless condition. It is interesting to note that of 45 patients who had hemorrhage during pregnancy, 13 went to the normal end of pregnancy, and of these, 7 died of hemorrhage. Of 24 patients whose hemorrhage first developed at the end of pregnancy, but one perished from bleeding.

Piskacek had 83 cases of placenta prævia, all of whom were eight months advanced in pregnancy. Of these, 4 died of hemorrhage, one having nephritis, and one disease of the thyroid. These cases were treated by version and the use of the elastic bag, with results which could scarcely be improved by Cesarean section. The fetal mortality was 66.2 per cent.; 7 of the children died during the first days of life, usually of inanition, so that but 15.6 per cent. of the children were discharged from the hospital in good condition. He believes that an improvement in the mortality of children can only be obtained by greater experience in conservative methods, and that but few cases will be found suitable for Cesarean section.

Ventral Total Extirpation of the Uterus for Placenta Prævia with Uncontrollable Bleeding. Runge¹ reports the case of a weak and anemic multipara, with central placenta prævia. An endeavor was made to check the hemorrhage and dilate the cervix by the use of an elastic bag. The cervix was dilated with two fingers, the placenta separated at one side, the membranes ruptured, and the bag introduced into the lower uterine segment. Although traction was made upon the bag, hemorrhage was severe. The pulse became 150, the extremities were cold, and it seemed impossible to extract the child because manipulation would cause fatal hemorrhage. Accordingly, lumbar anesthesia was given and the uterus extirpated by abdominal section. The child had perished, and it was interesting to observe that as the arteries were ligated in the operation, the pulse immediately became better.

The patient made an uninterrupted recovery and was discharged in good condition twenty-eight days after the operation.

The Treatment of Placenta Prævia. Pfannenstiel² regards the use of the *tampon in placenta prævia* as undesirable, and representing an unfortunate necessity. Not only is it insufficient to check hemorrhage, but its use exposes the patient to the constant danger of infection. The use of the elastic bag is much less dangerous.

Version and the use of the child as a tampon is attended with a maternal mortality of 9.64 per cent., and a fetal mortality ranging from 62 to 81 per cent. On the contrary, the intelligent use of the bag in Hannes' statistics gives a maternal mortality of 5 per cent., and in Pfannenstiel's

¹ Zentralblatt f. Gynäkologie, 1909, No. 31.

² Monatsschrift f. Geburtshülfe und Gynäkologie, 1909, Band xxix, Heft 3.

experience, 5.5 per cent., with a fetal mortality ranging from 42 to 51 per cent.

Pfannenstiël thinks it scarcely possible that the adoption of *Cesarean section in placenta prævia* will reduce the maternal mortality below 5 per cent. More children will be saved by Cesarean section, but at a much increased risk for the mother.

That the use of the *elastic bag* may be the most efficient and most safe, Pfannenstiël recommends the following method of application: The speculum should be used and the cervix drawn forward, and, if necessary, dilated sufficiently to admit the bag. For this purpose, it is useful to employ a long forceps with pelvic curve designed for the introduction of the elastic bag. The membranes or placenta should be perforated, and the bag placed in the cavity of the ovum. If this is accomplished, there need be no fear of separating the placenta. If possible, this perforation of the ovum should be done with the forceps containing the collapsed bag. Should this effort fail, any suitable instrument may be employed to perforate the ovum, the rent enlarged by the finger, and the bag then introduced. If the placenta is to be perforated, the thinnest point should be selected nearest to the cervix. The bag should be dilated with 500 c.c. of sterile salt solution, and to it should be attached a weight of one kilo. The bag should not be removed, but should be expelled spontaneously. When this occurs, dilatation is sufficiently advanced to permit the termination of labor by version and extraction. Used in this way, the bag is a most efficient method for controlling hemorrhage and securing delivery in *placenta prævia*.

Thies¹ reports the results in 64 cases of *placenta prævia*, in Bumm's clinic at the Charité, in Berlin. Of these patients, 3 died. In the Polyclinic service there were 115 cases of *placenta prævia*, with 2 maternal deaths. The entire series numbered 179 cases, with a maternal mortality of 3 per cent.

The causes of death were, hemorrhage after version; pneumonia four weeks after delivery; acute anemia after version and spontaneous birth; peritonitis after version; anemia following version and vaginal Cesarean section.

The fetal mortality in all was 60 per cent. If the prematurely born children are subtracted from the total number, and the mortality be estimated in the ninth and tenth months of gestation, it is reduced to 41.3 per cent. In the last 22 cases in the Polyclinic service, but four children were lost, and these were not at full term. This reduces the fetal mortality to 18 per cent.

In this series of 22 cases, the method of treatment consisted in the introduction of the elastic bag followed by version and extraction, and, in 11 cases, no children were lost. In 35 cases, it was sufficient to

¹ Monatsschrift f. Geburtshülfe und Gynäkologie, 1909, Band xxix, Heft 3.

rupture the membranes only; spontaneous labor then occurred, and 94 per cent. of viable children were born living. In 15 cases treated by the gauze tampon and elastic bag, the fetal mortality was 33 per cent. By combined version in 58 cases, 80 per cent. of the children perished.

Evidently, if fetal life is to be considered, two procedures promise the best success: one, vaginal Cesarean section; the other, the use of the elastic bag with version and extraction.

Müller's report upon 12 cases of *vaginal Cesarean section for placenta prævia* gives a fetal mortality of 20 per cent. On the other hand, the use of the elastic bag as a means of delivery was followed by a fetal mortality of only 14 per cent. Cesarean section, then, in placenta prævia, should be limited to primiparæ with unshortened and undilated cervix, both mother and child being in good condition.

Pankow¹ reports the case of a patient dying from air embolism following profuse hemorrhage after version for placenta prævia. He draws attention to the anatomy of placenta prævia, and emphasizes the impossibility of absolutely controlling hemorrhage by any method of vaginal delivery. For this reason he inclines to the treatment of this condition by *abdominal Cesarean section*, because this enables the operator to accurately locate the placenta, to remove it promptly, to check hemorrhage by the intelligent application of the tampon, and, if necessary, to ligate the uterine vessels and remove the uterus to save the mother's life. He believes also that some regard should be given to the life of the child, and that improvement in fetal mortality will best follow the treatment of these cases by section.

He reports 8 cases of placenta prævia treated by transverse incision, longitudinal opening of the peritoneum and uterus, rupture of the membranes, extraction of the child and placenta, and tamponing the uterus with gauze, with special attention to the lower uterine segment.

In many of these cases, lumbar anesthesia was employed. In 7 of the 8 cases, lumbar anesthesia with stovaine was employed. He believes the transverse incision of Pfannenstiel especially useful in delivering the child and in giving the operator access to the site of placental attachment. In 7 of the 8 cases, the placenta was more upon the anterior wall, and in 1, more upon the posterior wall of the uterus. In but one case did severe hemorrhage follow the separation of the placenta, and this was promptly checked by a gauze tampon. The average blood loss was not more than 150 c.c. All of the mothers recovered and were discharged in good condition in from thirteen to eighteen days after the operation. The puerperal period was uncomplicated. In one case, the abdominal wound became infected and the patient had moderate elevation of temperature for five days. She ultimately made a complete recovery.

¹ Zeitschrift f. Geburtshülfe und Gynäkologie, 1909, Band lxiv, Heft 2.

The children were all born living; one but eight months advanced, died some days after operation from inanition. Evidently such results are obtainable in hospitals only, and call renewed attention to the fact that complicated cases of parturition demand hospital care.

Krönig and Sellheim¹ reply to Martin's criticism upon the treatment of placenta prævia by abdominal section. They call attention to the merits of the suprasymphyseal section, the possibility of avoiding infection, and of dealing successfully with infected cases by suprasymphyseal drainage. They urge the application of surgical methods in the treatment of placenta prævia, and enter a plea for the improvement of our statistics instead of remaining satisfied with the methods of treatment already in use.

Ferroni² reviews the literature of placenta prævia, and tabulates 45 cases. His methods of treatment are confined to the use of the tampon, internal version, the use of the forceps, and artificial dilatation. His results do not differ essentially from other series of cases treated in the same manner.

His review of the literature embraces some of the recent German papers, and he discusses at some length the treatment of the condition by vaginal Cesarean section.

A complete review of the subject up to August, 1909, by Novak, from von Rosthorn's clinic in Vienna, is found in the *Monatsschrift f. Geburtshilfe und Gynäkologie*, Band xxx, Heft 2, 1909. From this review, the conclusions are drawn that patients with a tendency to placenta prævia should be sent to the hospital as early as possible. The various methods of treatment, their dangers and results are then discussed, and statistics given for each.

The methods of treatment consist in the premature rupture of the membranes, the use of the tampon, the use of the bag, combined version, and section. There is no question concerning the value of combined version, so far as checking hemorrhage is concerned, and it is interesting to note that, in 237 cases, there has been no case of air embolism observed. The danger of this complication is frequently urged against the performance of internal version. Internal version is attended with a maternal mortality of 8.8 per cent.; a fetal mortality of 71.8 per cent. As this is the method of treatment most constantly employed by the general practitioner, its results fairly express the mortality of placenta prævia at the present time under average conditions.

The improvements in this complication must be looked for in two directions: First, perforation of the sac of the ovum, and the introduction of the bag, as already described in detail by Pfannenstiel. This method of procedure can be carried out in private houses, although it requires expert manipulation, good judgment, and experience. The

¹ *Monatsschrift f. Geburtshilfe und Gynäkologie*, 1909, Band xxix, Heft 1.

² *Annali di Ostetricia*, November, 1909.

average practitioner of medicine could do great damage to the patient by separating a considerable area of the placenta in his efforts to perforate it. The use of the elastic bag requires experience and judgment, because it sometimes produces extensive lacerations of the cervix, from which severe postpartum hemorrhage develops. Furthermore, if too much traction be made upon the bag, it may be prematurely expelled, followed by alarming bleeding.

When the cases are in good condition and can be promptly transported to the hospital, an effort to save the life of the child may be made by Cesarean section. This should not be vaginal section, because the incisions in this operation are made through those portions of the uterus most full of blood, and from which dangerous hemorrhage is inevitable. Cesarean section for this complication should be done in a classical manner, as celiohysterotomy, or should be an isthmal section, as described in Pankow's paper, just quoted. This has the advantage of the suprasymphyseal incisions with longitudinal opening of the peritoneum and uterus, furthering the prompt delivery of the child, and giving the operator immediate inspection and access to the placenta. The use of the gauze tampon after operation is most important.

Placenta Prævia Marginata. Meyer¹ has made a study of a case of placenta prævia marginata in a uterus removed because of tuberculosis in the mother. Illustrations of the microscopic anatomy of the preparation accompany the paper.

This research indicates that placenta prævia marginata is characterized by the growth of the decidua and chorion, not at the border of the placenta, but further toward the centre, so that a peripheral placental zone of extrachorial tissue is formed. The formation of such tissue has some relation to the nutrition of the fetus, and the tissue is not formed in large extent. Two stages of its development are observed—the first, in which the chorial tissue extends up the uterine wall; the second, in which the chorial placental portion not only conforms to the contour of the uterine wall, but becomes an interstitial growth.

In the first stage, abortion and extrachorial development of the fetus may result. In the second stage, there is interference with the expansion of the uterus, especially at the region of the internal os, very much as there is in lateral placenta prævia, or in unusual growth of the placenta in bichorial twins along the uterine wall. The extrachorial placental zone occupies the lumen of the vessels of the parietal decidua. Its superficial surface is covered by it. In the later development of placenta marginata, thickening of the tissue may not occur, and infarction of the extrachorial zone may be practically unimportant. If this extrachorial growth occurs early in pregnancy, the decidua reacts to it by hypertrophy. Thickening of the placental border develops with increased

¹ Archiv f. Gynäkologie, 1909, Band lxxxix, Heft 3.

deposit of fibrin. The connective tissue or fibroid rings seen in these cases results from the fibrinous degeneration of thickened decidua and chorionic cells, and also from the fibrin deposit from the blood, as in a normal placenta. Placenta circumvallate is practically a placenta marginata whose border is directed internally. If the amnion is not involved, such cases are often described as placenta circumvallate. The genuine placenta marginata of extrachorial development of the placenta is in the parietal decidua. It is very doubtful whether all cases of extrachorial development of the fetus are those of genuine placenta marginata.

The Cervix in Labor. Colyer¹ contributes an interesting paper giving the results of studies to determine the relation between the time of rupture of the fetal membranes and lacerations of the cervix uteri. His conclusions are based upon 233 primiparous patients, 164 vaginal examinations in the puerperal period having been made. These examinations were on the ninth or tenth day of the puerperal period, and noted by the height of the fundus uteri above the pubis, the position of the uterus, and the presence or absence of flexion; the condition of the cervix regarding lacerations, the condition of the base of the broad ligaments, and the nature and quantity of the lochial discharge.

An endeavor was made to ascertain the definite relation between the lochial discharge and the degree of involution. This, however, could not be satisfactorily established.

Much to his surprise, Colyer could find no relation between the degree of involution and the presence of cervical lacerations. He became, however, convinced that the degree of dilatation of the os at the time of rupture of the membranes determines, for the most part, the degree of laceration of the cervix.

It is recognized that there are three factors concerned in dilatation of the cervix: Traction of the longitudinal fibers of the uterus, relaxation of its circular fibers, and mechanical pressure upon the bag of membranes or the presenting part. The membranes rupture when they are subjected to the most vigorous direct intrauterine pressure. Colyer believes that direct uterine pressure upon the fetus, forcing it downward, comes into play comparatively early in the first stage of labor. A portion of the amniotic liquid is thus retained in advance of the presenting part, and, as the fetus descends, this leads to a very gradual increasing pressure within the bulging bag of membranes. When the first stage of labor is normal, the presenting part descends into the dilated cervix by which it is not tightly grasped, and hence lacerations are not likely to occur. When the membranes rupture before the end of the first stage, the presenting part descends into an incompletely dilated cervix, expulsive efforts are aroused, and great force is brought to bear upon the cervix,

¹ British Medical Journal, November 20, 1909.

which is not prepared for complete dilatation. Stretching, however, occurs very rapidly as the pains become more vigorous. The increase in force is very rapid, and severe lacerations of the cervix usually occur in cases where the membranes rupture when the os is seven-eighths dilated, thus enabling the presenting part to descend. When the membranes rupture before the os is sufficiently large to allow the presenting part to enter, lacerations are less severe.

A study of the statistics shows that 5 per cent. more severe lacerations occur in those cases in which, the cervix being considered as fully dilated, the membranes are artificially ruptured. In such, the percentage of deep lacerations was 45. In those cases in which the os was not larger than a dollar, 12½ per cent. showed deep lacerations, but some lacerations occurred in every case.

The average weight of the infant and suboccipitobregmatic diameter and circumference were also considered with relation to rupture of the cervix, and no direct relation could be traced between these factors and the occurrence of lacerations.

Clinically, it is of the utmost importance that no haste should be used in delivering the child through a partly dilated cervix. The membranes should be ruptured only for definite indications, and not simply to hasten labor. When such a course is necessary, the best time for rupture appears to be when the os is half dilated. Toward the end of the first stage and the beginning of the second, the patient should be advised not to strain or bear down. Rupture of the membranes will then occur in the most favorable manner, and at the most advantageous time.

Indications for Dilatation of the Cervix. Pfannenstiel¹ draws attention to the complications arising during labor which may call for rapid dilatation of the cervix.

If obstacles to delivery arise in the cervix, and the patient's life is threatened, as in eclampsia, and placenta prævia; or fetal life is in danger, as in prolapse of the cord; or if dilatation of the cervix is retarded by scar tissue or great rigidity—the practitioner is justified in employing multiple incisions, making two or three, extending from 2 to 3 cm. in length, forming a Y-shaped incision. When the cervix is dilatable, and the indications are not for immediate action, the elastic bag is to be chosen. If the mother's life is in danger and delivery must be promptly effected with the extraction of the child, Cesarean section is indicated. Such cases naturally must be brought to hospitals.

Bossi's dilator should not be used by the general practitioner, as the danger of extensive lacerations is so great that fatal injury may follow. The use of the bag, however, can be attempted in private house with greater success.

¹ Monatsschrift f. Geburtshilfe und Gynäkologie, 1909, Band xxx, Heft 5.

The Choice of Methods for Rapid Dilatation of the Cervix. At the International Congress in Budapest the proceedings are reported in the *Monatsschrift f. Geburtshülfe und Gynäkologie*, Band 30, Heft 4, 1909.

Bar called attention to the rapid dilatation of the cervix in producing deep lacerations and in failing to remove the obstacles to the passage of the fetal head. Dilatation with the elastic bag is less dangerous, while digital opening of the cervix is too slow and too impracticable, but less dangerous than the use of Bossi's dilator. In this connection vaginal Cesarean section must also be considered. Low attachment of the placenta, contracted pelvis, and large size in the child, are contraindications to vaginal Cesarean section. Where the circumstances render dilatation of the cervix dangerous for the mother, abdominal Cesarean section should be chosen.

In infected cases extraperitoneal section is indicated, and in all cases there must be a pronounced necessity for rapid dilatation to justify the operation. The condition of the child naturally has considerable bearing upon the choice of methods.

Bossi reported 395 cases of dilatation of the cervix by the use of his dilator. He compares this method with forcible dilatation and Cesarean section in placenta prævia and premature separation of the placenta. He estimates that Cesarean section gives twice as great mortality, and but one-fourth as great fetal mortality. In a third table, he compares the results of the use of Bossi's dilator with rapid dilatation and Cesarean section in eclampsia, and claims that his method gives the better result.

Winter reported 245 cases of dilatation of the cervix with Bossi's dilator, and had found by experience that the cervix must be completely obliterated and the os the size of a dollar before the cervix can be safely dilated with the Bossi instrument without danger of serious laceration.

In primiparous patients vaginal Cesarean section is indicated. This method empties the uterus in the least dangerous manner, and also gives a chance for the life of the child. It is applicable in eclampsia, premature placental separation, placenta prævia, pulmonary diseases, lesions of the heart and kidneys, infection developing during labor, stenosis of the cervix, and death of the mother before delivery.

Gauss compared his results in 75 cases in which Bossi's dilator was used with 50 cases of vaginal Cesarean section. In one case in which Bossi's dilator was used a fatal result followed, and one case had severe cervical lacerations. In early pregnancy the use of Bossi's dilator was not indicated because the cervix is not prepared for dilatation. Where the cervix is unusually thick and resisting in the later months of pregnancy, this method is also contraindicated. In placenta prævia, both the use of Bossi's dilator and vaginal Cesarean section are contraindicated.

In the same discussion, Winter, of Königsberg, stated that the mortality of vaginal Cesarean section in his experience is not above 1 in 100. He believes this method the best for rapid opening of the cervix.

THE PUERPERAL PERIOD.

The Rational Puerperium. Ballantyne¹ reviews the history of efforts which have been made to introduce early getting up and early exercise in the puerperal period.

In the service immediately preceding his at the Edinburgh Maternity Hospital, the practice had been to allow the normal puerperal cases to rise on the fifth day, and two patients suffering from phlebitis were found in the wards. Ballantyne determined to test the value of prolonged rest for ten or eleven days in the horizontal position for puerperal women.

Haultain has shown, in 100 cases, that the dorsal decubitus could be abandoned without accident. The advantages of early rising are the strengthening of the abdominal and pelvic muscles, improved digestion and appetite, easy relaxation of the bowels, more ready escape of the lochial discharge, and a general stimulating effect. In order to procure a proper discharge of the lochia it was customary to give quinine and ergot to the patient during the puerperal period, and this was continued during the method of treatment which Bossi finally adopted.

Under the supervision of the nurses, each patient was covered with a blanket, and lay flat in bed with her arms by her sides. A nurse standing in the centre of the ward directed the exercises. The patients were directed to turn from the back to the side, rolling to the side three times, drawing up the knees three times, and rolling out at the opposite side three times. Then followed exercises with the arms six times. Breathing exercises were also done six times, and the gymnastics were concluded by rolling from side to side three times.

In the majority of cases these movements were begun on the first day of the puerperal period during the second twenty-four hours after labor. In no case were they begun later than the fourth day. On the first day they lasted for about ten minutes, the second for twenty minutes, the third for thirty minutes, and never exceeded that time. The exercises were entirely voluntary, and the majority of the patients seemed to enjoy them. The tone of the abdominal muscles improved, and in most patients it was above the average when they left the hospital. It could not be observed that the action of the bowels was influenced by the gymnastics. The tone of the abdominal muscles was classified as good in 81 cases; fair in 19; bad in 7; and excellent in 6.

One hundred and fifty-two patients were treated in the hospital

¹ British Medical Journal, January 1, 1910.

while these observations were being made; 9 came for pre-maternity treatment and left before delivery. Of the remaining 143, 21 were not allowed to do the exercises. The rest, 122, performed the movements as announced. In 15 of these cases the accurate test of the tone of the abdominal muscles could not be made. There were 107 in whom the method was tested under circumstances favorable for accuracy.

Among these there were 69 who did the exercises from the first day. Some of these were forceps cases, several had adherent membranes, two were breech cases, and one had occipitoposterior rotation. In 18 cases in which exercises were begun on the second day, there had been some interference or anomaly. In the 16 in which movements were begun on the third day there had been some serious complication, such as craniotomy, eclampsia, albuminuria, postpartum hemorrhage, and induction of labor. There were 4 patients who had had some dangerous complications in whom movements were not begun until the fourth day.

With regard to the assumption of the erect posture, 43 got up on the seventh day, 38 on the eighth day, 19 on the ninth, 4 on the tenth, and one each on the sixth, eleventh, and twelfth days. Many patients got up on the seventh day. These patients had less dizziness, weakness and general malaise than those who remained longer in bed.

When the patients got up on the seventh or eighth day there was generally a rise in pulse rate, with a fall in blood pressure, the pulse rising often twenty beats to the minute, the blood pressure falling from four to ten degrees, or even twenty. The change in pulse rate is much more constant than the change in blood pressure.

There was no mortality, and there was no morbidity among the 107 patients who performed the exercises described. In no case did the temperature rise above 100° F. for more than one reading, with a pulse of more than 90.

With regard to the displacements of the womb, in 3 cases there was a slight deviation of the uterus to the right side, and in 2, anteversion more marked than normally. Among the patients who took the exercises there were 4 in which the uterus was retroverted; one of them had craniotomy during labor.

From his observations Ballantyne believes the following conclusions permissible: The period of rest after labor for the ordinary hospital patient will be reduced from ten or eleven days to eight or nine, the patient getting up after normal labor on the eighth or ninth day. The carrying out of exercises in the horizontal position during the early days of the puerperal period keeps the muscles in good tone, diverts the patient, and prepares her for the resumption of the erect posture. If these exercises be carried out systematically it may be possible to allow patients to get up on the seventh day.

The question of rising in the puerperal period must be studied in

connection with the pulse rate, blood pressure, temperature, and other phenomena of this period. Other methods of influencing the puerperal period must also be considered. Normal cases must be carefully distinguished from abnormal ones, and the treatment selected for each patient. The pregnant patient demands care before labor, close observation during the stress and strain of childbirth, and in the puerperal period as well.

In discussion, Haultain, in 125 cases where the patients rose as early as the third day after labor, had seen no phlebitis or pulmonary embolism. Prolapse had occurred in patients who had remained in bed during the customary period.

The Influence of Rest in Bed upon the Occurrence of Thrombosis and Embolism after Confinement and Gynecological Operations. Hoehne¹ states that puerperal and operative cases make a quicker, smoother, and more physiological recovery in the puerperal period upon getting up early after delivery or operation.

He quotes Liebrecht's statistics of 1239 cases of gynecological operations, with 20 cases of thrombosis and embolism, or 1.61 per cent.; operations for the removal of myomata at 3.7 per cent.; operations for carcinoma, 2.5 per cent.; vaginal operations for fixation, 2 per cent.; operations to undo vaginal fixation had no thrombosis.

In the puerperal period the patients remained in bed the accustomed time. In Schuster's series of 11,000 cases, thrombosis and embolism occurred in 0.5 of one per cent. Other statistics ranging from 16,000 to 40,000 labors give a percentage of thrombosis and embolism varying from 0.4 to 0.6 per cent. In his own experience, in 200 puerperal cases one case of thrombosis occurred. Pulmonary embolism occurs but once in 2000 labors, and fatal embolism but once in 4000. In 22 cases of eclampsia there were 3 of thrombosis and embolism—one with a fatal issue.

It must be remembered that these cases are especially prone to the development of this accident.

Haultain's conclusions are that early rising in the puerperal period and after operation tends to lessen rather than increase thrombosis and embolism.

The same subject is considered by Fromme.² He considers a rational early rising to be cautiously sitting up out of bed, the patient not to move about during the early days, nor to undertake work of any sort. Rise of temperature is an indication for returning to bed. His cases numbered somewhat over 100.

He quotes the interesting case of a primipara, aged nineteen years, who was repeatedly examined by midwives, assistants, and students, before the rupture of the membranes during labor. After the delivery of the placenta there was slight postpartum hemorrhage, which was

¹ *Monatsschrift f. Geburtshülfe und Gynäkologie*, 1909, Band xxx, Heft 5.

² *Zentralblatt f. Gynäkologie*, No. 1, 1909.

readily checked. On the second day of the puerperal period, her temperature being normal, the patient left her bed for one hour, which she seemed to enjoy. The next morning the temperature rose to above 103°, with a pulse of 114, and slight pain in the left side of the abdomen. The patient was removed to the septic wards of the hospital, a bacteriological examination of the lochia was made, and the blood examined for bacteria. On the following morning the temperature remained equally high and the pulse rose to 124. The uterus was well contracted and there was no tenderness. During the day the temperature fell to normal and the pulse to 100. The lochia contained abundant colonies of hemolytic streptococci, and the blood was sterile. The streptococci removed from the vagina did not give the reaction for virulence. On the following day the temperature rose to 100°; the pulse to 92. There was slightly painful resistance on the left side in the pelvic region for the next three days; the patient was without fever, the pulse falling to 76, but tenderness still remaining in the left side.

On the day following, the ninth day after labor, the patient's temperature suddenly rose in the morning to 103½° without a chill. The pulse was 116. No streptococci were obtained from the vagina, but diplococci were found. The temperature again fell to normal and the pulse below 100. The tenderness and resistance persisted on the left side. On the tenth day after labor, when the patient was without fever, she suddenly complained of a sensation of compression in the trunk, and the patient became cyanotic, breathing with the greatest difficulty. The action of the heart ceased in three minutes, when passive respiration was performed for twenty minutes longer without effect.

At autopsy the viscera was very anemic. In the pulmonary artery there was an embolus which totally obliterated the artery, the thickness of a finger. The left spermatic vein was thrombosed, extending to the renal vein. The veins of the left broad ligament were thrombosed, and the walls greatly thickened. In some places the thrombi had undergone softening. The uterus was well contracted, the site of the placenta and the uterine wall being normal. Where the thrombi had undergone softening, examination revealed the presence of streptococci. This did not yield results upon culture.

Frommé quotes from the statistics of Albanus 1140 abdominal sections with 4.64 per cent. thrombosis and 2 per cent. embolism. Among the cases of thrombosis were 38 in women, 15 in men, the average age of the patients being between thirty and forty years.

Operations about the intestine, rectum, tubes, and the pelvic viscera in general are more often followed by this accident. In 6600 confinements, with the usual prolonged rest in bed, Frommé had seen no case of puerperal embolism. He believes that one should be cautious in advising the early getting up of these patients.

Hofmeier reports 289 operations of various sorts upon the abdominal

and pelvic organs. Six cases of thrombosis occurred—3 after supra-vaginal amputation; 2 after vaginal extirpation of the uterus; 1 after double oöphorectomy. Of these 6 patients, 3 died: 1 with tetanus, 1 with peritonitis, 1 on the twenty-first day with pulmonary embolism.

Of the first 2, autopsy revealed thrombosis—once in the iliac, and once in the spermatic vein, of which there had been no symptoms during the patient's illness. In 2 cases there was very moderate fever, and in 1 thrombosis occurred eight days after the patient left the hospital, or fourteen days after the patient left her bed. In 2 cases after oophorectomy there was a very trivial thrombosis of the thigh, and this also occurred three times after total vaginal extirpation of the uterus. These cases had no fever. But 3 cases of thrombosis gave symptoms during life, and in but 3 of the cases could any relation be traced between the occurrence of thrombosis and the patient's lying in bed.

The patient having embolism twenty-one days after operation was in a very anemic condition.

In all, among 525 operations for myomata, 2 perished from embolism following thrombosis at the site of operation; 18 patients had thrombosis, first discovered at autopsy in 5. It is thought that the lessening of thrombosis after operation during recent years could be traced to the early getting up of the patients.

In 10,000 puerperal cases there were 12 cases of thrombosis, 9 with high fever after severe and complicated deliveries. In but 3 of these 12 cases was the puerperal period without fever. In one there was thrombosis of the popliteal vein with severe pain; in another a slight thrombosis of the epigastric vein; and in the third a slight thrombosis as the result of varices in the lower extremities. In none of these cases did embolism or death result.

The early getting up of these cases seemed to lessen the frequency of thrombosis and embolism.

Ligation or Excision of Thrombosed Veins in the Treatment of Puerperal Pyemia. Williams¹ considers the average mortality of puerperal pyemia as practically two-thirds of all cases, or $66\frac{2}{3}$ per cent.; 56 cases of thrombophlebitis were treated by excision or ligation of one or more pelvic veins. Of these, 15 operations were done by the extraperitoneal method, and 41 by the transperitoneal method. In the 15 operations, the mortality was 80 per cent.; in the 41 cases, the mortality was 43.9 per cent. This mortality did not differ materially from the expectant treatment of this condition.

If cases not susceptible to cure and treated with faulty technique are subtracted, the extraperitoneal method of operation gives a corrected mortality of 40 per cent., and the transperitoneal method a mortality of 21.4 per cent. In 5 cases operated upon by Williams, the gross mortality was 20 per cent.

¹ American Journal of Obstetrics, May, 1909,

When thrombosis is limited to the spermatic veins, early operation should not have a greater mortality than 10 per cent., but if other vessels are involved, the mortality rises to 25 per cent.

Operation should be undertaken as soon as the worm-like mass can be palpated at the outer portion of the broad ligament in patients suffering from chills and fever. Ligation is usually sufficient, and excision should be performed only when the vein seems liable to rupture, or is surrounded by inflammatory tissue. The transperitoneal is preferable to the extraperitoneal method. It is technically easier; gives a more extensive view of the vessels, with the proper precautions; does not increase the danger of infection.

In a small class of cases where the thrombosis is limited to the vessels of the broad ligaments, the vaginal route might be employed. In these cases the diagnosis is so difficult that abdominal section should be performed in the interests of accuracy in all patients in whom this complication is suspected.

Brettauer¹ operated upon a patient, aged twenty-one years, a primipara, who eighteen days before admission had been delivered at term without a single vaginal examination by the physician in charge. A severe chill occurred on the fifth day, with pain and vomiting, and chills had recurred twice daily, with high temperature.

Upon examination, the vulva and vagina were negative, the uterus was involuted and retroposed. No mass of increased resistance could be found in the parametria. The blood culture was negative, and the urine contained no microorganisms. The leukocyte count was 32,000.

At operation, both ovarian veins were ligated, the left doubly ligated with silk and cut across. The lumen of the vein contained fluid blood. The same operation was performed upon the right side. The patient's condition was not materially improved, and death followed in coma eight days after operation.

Upon autopsy there was no evidence of peritonitis. In the uterine wall there was necrosis at the placental site. The ovarian veins were filled with fresh uninfected clots extending from the site of location to the uterus. The ligated cut ends had healed. The uterine and hypogastric veins were negative. The left common and external iliac was filled with semifluid purulent material. On the right side the veins were not affected. In the inferior vena cava a thick, adherent, purulent thrombosis extended from the beginning of the vein to the diaphragm. The lungs were riddled with abscesses corresponding to the distribution of the pulmonary artery.

The Involution of the Puerperal Uterus and its Circulatory System. Goodall² contributes an interesting and well illustrated paper upon this subject. He finds that the uterus renews its arteries after each

¹ Surgery, Gynecology, and Obstetrics, December, 1909.

² American Journal of Obstetrics, December, 1909.

pregnancy, believing there are new vessels within the lumen of the old. Where the small vessel is formed within one of large caliber it will have three completely developed coats—intima, media, and adventitia. Where the vessels reduce their caliber but slightly, a new intima is formed and a portion of the media of the old vessels is incorporated in the wall of the new. In normal cases, the walls of superfluous old vessels are slowly completely obliterated. In patients of advanced age or with chronic disease, this process is very incomplete.

The difference between the parous and nulliparous arises from the incompleteness of destruction and absorption of the waste products. In young healthy patients who have borne children, involution can be so perfect that microscopically it cannot be distinguished from conditions found in the virgin uterus. The changes in the walls of the vessels of the uterus are closely allied to those about the atrophic corpus luteum. Acute disease may completely stop involution, and local or general disease much delays it. Variations in the process cause conditions resembling a series of involutions. In later years, and under the influence of disease, muscular tissue is often replaced by elastic tissue. The same changes occur in the cervix which are seen in the body of the uterus, the veins being reduced by the growth of hyaline tissue in their walls. Normally, this is replaced by muscle which in large vessels is formed into bundles, but in patients above the average age or diseased, this growth is replaced by elastic tissue. There is no evidence that syncytial cells have any influence upon changes in the uterine veins. Many appearances in the mucosa of the uterus of women who have borne children are produced by atrophic elastic tissue, and not blood clots. This may remain unabsorbed for an indefinite time, and is a positive sign that pregnancy has at some time been present. The elastic tissues of the original vessels become atrophic or hypertrophic. This latter, unless disturbed by subsequent pregnancy, constitutes the so-called sclerosis of pregnancy. Fatty changes are found in the elastic tissue, the muscular cells of the parent media, and in the cells which replace clots in the placental vessels. The muscular cells of the uterus and cervix also undergo fatty degeneration. The fibrous tissue of the uterus shows hyaline degeneration with slow absorption. Many uterine muscular fibers completely disappear, especially in the large arteries. The uterine arteries and veins undergo a slight reduction in their lumen.

Early Rising in the Puerperal Period. Hüffell¹ reports the results of early getting up in 234 cases, 150 leaving their beds between the second and fourth day for the first time; 61 on the second day; 64 on the third; and 25 on the fourth.

These patients wore the broad, firm, abdominal binder, and were

¹ Zentralblatt f. Gynäkologie, 1909, No. 22.

allowed to sit in a comfortable chair for one hour. The lochial discharge was collected so that the amount could be better measured. If no alteration in pulse and temperature occurred, the patient was allowed on the following day to sit up an hour longer, until on the eighth day she sat up for the entire day. The patient was not allowed to move about for the first three days, and at no time was she allowed to work. After the bowels had been opened by castor oil on the second day the patients had the usual hospital diet of a nourishing sort. None of these patients were allowed to get up, and those who had complications in labor or the puerperal period were kept in bed.

In 134 out of the 234 cases, the puerperal period was entirely free from fever. In 16 cases there was transient and slight rise in temperature; 4 patients had slight endometritis; 5 had mastitis, in 1 case abscess resulting.

In the 16 patients who had fever, 7 were obliged to return to their beds. One of these had hemorrhage, one had attacks of fainting. The morbidity of the entire series was 11 per cent. No injurious effect was observed upon the pulse, nor could it be seen that involution proceeded more rapidly than in those patients who remained in bed.

There was no essential change in the character of the lochia. The patients who got up emptied the bladder and rectum much more satisfactorily than did those who remained in bed. The general condition and the appetite were good. The patients generally thought that they were better than on former occasions when they had remained quiet.

On the ninth day, in 60 per cent. of the cases bimanual examination showed good involution; in 30 per cent. the involution was less complete; in 10 per cent. the involution was deficient. Retroflexion was observed three times.

The development of the child did not seem to be influenced by the early rising of the mother, and those mothers who got up early were able, as a rule, to nurse the children.

An endeavor was made to examine these patients four weeks after confinement. In 46 cases so examined, 5 complained of pain in the lower abdomen; 3 had profuse menstruation, one six months after labor. In 27 of the 46, the pelvic organs were normal; in 11 there was retroflexion of the uterus, with fixation in 1. In 8 of these cases the retroflexion gave rise to no symptoms, while 3 complained of slight pain.

The morbidity rate of these patients was distinctly less than among those who did not get up so early.

To what Extent is the Occurrence of Retroversion of the Uterus Dependent upon the Recumbent Posture after Labor. Heymann¹ has investigated the influence of the recumbent posture on the production of retroversion during the puerperal period.

¹ *Monatsschrift f. Geburtshilfe und Gynäkologie*, 1910, Band xxxi, Heft 2,

His material is divided into four groups, the first, comprising in five years 640 cases, in which puerperal patients got out of bed from the second to the fourth day, and were usually discharged from the hospital during the second week after labor. Among these were four who developed retroflexion of the uterus. One of them was a multipara. The percentage of retroflexion was 0.62 of 1 per cent.

The next period comprised 670 cases in which patients left their beds on the fifth day after labor, and among these were 11 cases of retroflexion of the uterus, or 1.6 per cent. There were more primiparæ than multiparæ, some of whom had suffered from menorrhagia, constipation, and abdominal tension, indicating that possibly retroflexion had existed before labor.

The next group of cases was 790 patients, who were kept strictly in the recumbent posture in bed for eight days, first getting up on the ninth day. Among these were 21 women who had retroflexion of the uterus at the time of their discharge from the hospital. Among these there were more primiparæ than multiparæ, and in very few cases could a previous history of retroflexion be found.

In the last group the patients got up on the fifth day, and the results were identical with those in the second group when the patients left their beds on the fifth day. The percentage of retroflexion was 1.6 per cent.

When these statistics are critically analyzed it is found that among the patients getting up from the second to the fourth day, one-half of 1 per cent. had retroflexion. Among those remaining in bed until the ninth day there were 2 per cent., or four times as many.

From these observations, Heymann believes that there can be no objection to the early getting up of patients after normal spontaneous parturition, in the absence of infection and complications. The percentage of fever, thrombosis, and embolism is less when the patient assumes the partially erect posture than when she remains in the recumbent position.

He recommends that patients leave their beds on the fifth day after sitting up in bed on the fourth day. No douches are given, but the external genital organs are cleansed twice daily with 1 per cent. lysol. Gymnastic exercises are not advised. The general health of the patients was better under this treatment, the only precaution being that such cases were not allowed to resume their usual occupations and to do active work until they had made a complete recovery from labor.

The Percentage of Hemoglobin, and the Number of Red and White Cells in the Blood of Puerperal Patients. Ogata¹ studied the blood of 100 puerperal patients in the hospital in Tokio. The first examination was made during the first day after labor; the second during the eighth

¹ *Monatsschrift f. Geburtshülfe und Gynäkologie*, 1909, Band xxx, Heft 6.

day. The results are minutely tabulated: 12 per cent. was taken as a normal percentage of hemoglobin. It was thought that the hemoglobin increased slightly during the last weeks of pregnancy, while the red cells diminished somewhat, and the white cells increased. Following labor the hemoglobin and the red cells were diminished. During the normal puerperal period both of these again increased, while the number of white cells was greatest soon after labor. Lactation exercised a favorable influence upon the regeneration of the blood.

Among the normal non-pregnant women the average number of red cells was 4,500,000, leukocytes 9000, hemoglobin 12 per cent., the proportion between the red and white cells 500 to 1.

On the first day of the puerperal period the number of red cells was 4,031,550, the leukocytes were 23,660, hemoglobin 8.2 per cent., the proportion between red and white cells 170 to 1.

During the last week of pregnancy the number of red cells was 4,324,000, leukocytes 21,000, the proportion of red to white cells 205 to 1.

Labor increased the red cells and diminished the leukocytes. On the eighth day of the puerperal period the average number of red cells was 4,411,264, leukocytes 20,388, the proportion between red and white cells 212 to 1, hemoglobin percentage 8.6 per cent.

Thus, during the first seven days of the puerperal period there was an increase in the red blood cells, the proportion between the red and white cells was increased, and on the eighth day of the puerperal period the red blood cells had assumed the same proportion which was found in the last week of pregnancy. After labor the white cells decreased.

Menstruation during Lactation. Sundin¹ studied the question of the occurrence of menstruation during lactation. He refers to Mayer's paper, published in 1873, who reported 58.7 per cent. of patients who menstruated during lactation. Bendix, in 1898, reported 60 per cent. In 1906, Essen-Möller and Heil repeated these observations, the first finding 59 per cent. and the second 62 per cent. of cases menstruating during lactation. Sundin studied 335 cases, in 186 of which in women nursing their children, or 55 per cent., menstruation returned. In 129, or 38.5 per cent., there was amenorrhea, and in 20 women, or 6 per cent., menstruation returned during lactation, although at other times it was scanty or deficient.

These observations seemed to agree in establishing the fact of this occurrence.

In 175 cases the time at which menstruation returned was observed. Between the first and second months in 37.1 per cent.; between the third and fourth months in 16 per cent.; between the eleventh and twelfth months in 14.9 per cent.; between the ninth and tenth months

¹ Zentralblatt f. Gynäkologie, 1909, No. 7.

in 10.9 per cent.; and between the seventh and eighth months in 4.6 per cent. In more than one-third of the cases menstruation returned during the first two months after labor.

Three times as many primiparæ menstruated during lactation as did not. Among the multiparæ the percentage was 2 to 1; in 23 per cent. it was observed that menstruation recurred so soon as the child was wholly or partially nourished upon the bottle; while in 59 per cent. no influence upon menstruation could be observed from bottle feeding.

In general, it may be concluded that from 55 to 29 per cent. of women nursing their children menstruate during this time, and that in cases of mixed feeding no influence could be observed upon menstruation in 59.6 per cent.; while only 23 per cent. were influenced by artificial nourishment.

The Checking of Lactation. Storrs¹ reports the results of the following treatment in 171 cases in which it was desirable to check the secretion of milk. These cases were equally divided between primiparæ and multiparæ.

In 45 per cent. pregnancy terminated before its normal end, while in 55 per cent. labor occurred at full term. The breasts were left absolutely alone on the days immediately following labor. They frequently became considerably engorged about the third day, and occasionally quite painful. The patients, however, were told that swelling and pain would promptly disappear and that no treatment was necessary. Within the next twenty-four or thirty-six hours the swelling subsided, after which the secretion gradually increased in amount, to disappear entirely before the end of the first week. When the breasts were large and pendulous, a loosely fitting bandage was applied to keep them from sagging, but not to exert pressure. Probably once in twenty cases a single hypodermic of codein was given to relieve pain during active engorgement. During the past four years in the Johns Hopkins clinic the use of the breast pump, belladonna plasters, and tight breast bandages have been entirely abandoned, with very satisfactory results.

The Immediate Repair of Perineal Lacerations. Sigwart,² at the Charité in Berlin, has obtained good results in the immediate closure of the torn perineum while using clamps upon the skin surfaces. In 125 cases, primary union occurred in all but 12. The deep lacerations in the vaginal floor and sulci were closed with catgut. In very fat patients it was often necessary to employ silkworm-gut passed deeply through the skin surfaces. In some cases buried stitches were inserted to bring together the torn muscle and fascia. The advantages of the clamps consist in the avoidance of stitch canals, the avoidance of their infection through the lochial discharge, and the fact that stitches often strangulate

¹ Surgery, Gynecology, and Obstetrics, October, 1909.

² Zentralblatt f. Gynäkologie, 1909, No. 10.

the tissues in such a way as to produce necrosis and cutting. The clamps are easily removed with forceps designed for the purpose.

Mayer¹ has had excellent results in the use of clamps in bringing together the skin edges in the recently torn perineum and also the skin edges in abdominal wounds. One great advantage of their use is rapidity, as a long abdominal incision can be completely closed by clamps in two minutes. This method also avoids the introduction of bacteria from the skin into the subcutaneous tissues. The resulting scar is a fine line without thickening of the tissues. In using the clamps upon the perineum the possibility of infection from the bowel must be kept in mind. In 30 cases in which the clamps were used in the perineum, primary union occurred; in 3 cases the tissues in the posterior wall of the vagina were closed by secondary union.

In using the clamps it is important that no pockets form in the wound. It is best to bring together the fascia of the pelvis and the levator ani muscle with buried stitches of catgut, and to use clamps for closing the skin edges. In closing abdominal wounds the clamps should be placed $\frac{1}{2}$ cm. apart. The wound is then covered with protective, and dermatol freely powdered over the parts. The use of the catheter is avoided, and douches are not given. The clamps were removed on the sixth and seventh day. The patients experienced little or no pain from their use.

The Healing of the Umbilicus with the Omission of the Daily Bath. Eicke² studied 7300 healthy infants, among whom occurred 72 deaths, or 0.9 of 1 per cent. In these cases no affection of the umbilicus or its tissues was found.

In 176 cases among the 7300, there was some affection of the umbilicus characterized by fever or some disturbance of the general health. In 20 cases no other cause for the disease could be found, and it seemed probable that umbilical infection was present.

In these cases of umbilical disease the elevation of temperature was but slight in the majority of cases; 6 of these terminated fatally, with various manifestations of infection. The length of the infection varied from two to four days. The separation of the umbilical stump was prolonged to the ninth day, and in some cases the cord had not dropped before the mothers left the hospital. In some cases the fever promptly declined, and alcohol was applied to the umbilical tissues. The cord usually dropped from the eighth to the tenth day.

In treating the cord, midwives and nurses are obliged to wear rubber gloves which are cleansed in lysol. The blood is pressed out of the stump of the cord and the cord ligated with linen tape cut with sterile scissors, leaving a stump of 2 to 3 cm. The child is then bathed, weighed, and measured. The basin from which the child is bathed is cleansed

¹ Zentralblatt f. Gynäkologie, 1909, No. 5.

² Zeitschrift f. Geburtshülfe und Gynäkologie, 1908, Band lxxiii, Heft 3.

with sublimate solution. It is thought unnecessary to use sterile water because the infection of the umbilicus does not arise from water but from the hands of the person bathing the child. The stump of cord is covered with sterile cotton and a bandage.

Among the 7300 cases there were but 0.76 of 1 per cent. which had fever connected in any way with umbilical infection. For disinfecting the tissues about the umbilicus, alcohol is far superior to any other agent.

Solid Tumors of the Umbilical Cord. Herwig¹ reports the case of a patient, aged twenty-six years, who had some pulmonary affection during her pregnancy. This was diagnosticated as tuberculosis. The birth of the child was spontaneous; the child, a female, was born in good condition; its length was 49 cm. The after-birth was expressed half an hour after the child was born, and the cord was 54 cm. long. Upon the cord was a number of solid tumors, which upon microscopic examination proved to be angiomyxomata. Their presence did not interfere with the recovery of the mother and child.

An Unusual Anomaly of the Cord. Ellerbroek² reports a case in which the placenta was of the usual form and the membranes were intact. The umbilical cord measured from the placenta to its point of ligation 58 cm. Its insertion was at one side of the centre, and in addition to the cord there was a band of tissue which seemed to be an overdilated vessel. A second similar vessel was developed in the circumference of the placenta. The lumen of this vessel was greatly lessened by the removal of the placenta, although no abnormality or change was found in the vessel in the superficial portion of the placenta.

Spontaneous Birth as a Cause of Deformity of the Shoulders. Sellheim³ drew attention to the fact that in spontaneous parturition the pressure upon the shoulder and the tension upon the inferior portion of the trapezius muscle were such as to produce paralysis and shoulder deformity. Scoliosis of the vertebra was also observed in these cases.

The Prevention of Puerperal Septic Infection. In this important subject it is interesting to observe the results in two clinics in which different methods of preventing septic infection are employed.

Hofmeier⁴ had 11.48 per cent of cases in which the thermometer showed once at least a temperature of more than 100.4° F. Of these, only 2.18 per cent. became seriously ill. In 10,000 woman, 9 died of puerperal infection. Of these the greater portion were infected before admission. It was assumed that but 0.4 of 1 per cent. was the septic mortality of the clinic. Among 7000 patients there occurred no death traceable to hospital infection.

Vaginal examinations were allowed as often as necessary for purposes

¹ Archiv f. Gynäkologie, 1909, Band lxxxix, Heft 2.

² Ibid.

³ Zentralblatt f. Gynäkologie, 1909, No. 42.

⁴ Münchener med. Wochenschrift, September 15, 1908.

of practice and of teaching. He believes that hands which have been well washed with soap and water and with 1 to 1000 solution of bichloride of mercury are practically sterile. He believes that the parturient woman can infect herself with bacteria already present in the vagina.

Henkel¹ uses Ahlfeld's method of disinfection with hot water and alcohol, and uses sterile rubber gloves in all suspected cases. He believes that streptococci are often found in the vagina, and that the chief danger for the patient lies in the small scratches and tears made by manipulation through which germs may enter. He makes vaginal examination as rarely as possible, depending upon palpation.

Scanzoni, in 157 births, among which 97 patients were not examined at all, observed fever in 21.6 per cent.; in 112 patients who were delivered without external contact, 11.5 per cent. had fever up to 102.5° F., undoubtedly from infection. These observations seemed to establish the point of the possibility of autoinfection, in spite of different methods which may be used to prevent it.

Injury to the Puerperal Uterus. Cragin² draws attention to injuries to the puerperal uterus occurring in cases where it seems necessary to deliver the patient as rapidly as possible. In eclampsia, where the cervix is long and rigid, elastic bags should be employed before rapid dilatation and delivery are practised. Where this is impossible, vaginal Cesarean section is indicated to avoid serious cervical tears. In placenta prævia especial caution is needed, as the abnormal attachment of the placenta makes the lower uterine tissues unusually elastic and friable.

In 20,000 cases at the Sloane Maternity there were 30 cases of rupture of the uterus, or 1 in 666 $\frac{2}{3}$ deliveries; 15 occurred before the patient was brought to the hospital, and 15 after admission; 16 were complete, and 14 incomplete; one occurred spontaneously.

The maternal mortality was 86 $\frac{2}{3}$ per cent.; the fetal mortality, 80 per cent. Of 15 who objected to abdominal section, 2 recovered and 13 died; of 23 treated by the gauze tampon, 3 recovered and 20 died. Among these, 14 cases were incomplete. Of the 26 maternal deaths, 15 were from shock and hemorrhage, 9 from infection, and 2 from eclampsia independent of the rupture.

Cragin describes one unusual case where a physician in a private house endeavored to deliver a patient with forceps, using chloroform. The nurse administering the chloroform spilled a portion of it upon the face of the patient. As she was not completely anesthetized she became excitable with pain, and threw herself about the bed, falling upon the handles of the forceps. The head which had previously engaged, receded, and the child was delivered by version. The uterus was torn across the anterior wall without opening the peritoneal cavity. Under the use of the gauze tampon this patient recovered.

¹ Deutsche med. Wochenschrift, 1908, Nos. 43, 44, 45.

² American Journal of Obstetrics, February, 1910.

Cragin calls attention to the dangers of injuring the puerperal uterus by the injudicious use of the curette after labor. The uterus should be cleansed in the most gentle manner possible, and when this had been done no further curetting or douching should be practised.

The Puerperal Period Complicated by Scarlatina. Falk¹ reports the case of a patient who had a normal labor, and who on the fourth day after delivery had a normal temperature with a pulse of 104. The patient complained of pain in the legs, tightness in the thorax, difficulty in swallowing, and pain in the neck. The mucous membrane of the mouth was injected, the lymphatic glands of the neck somewhat enlarged and painful, and the face was reddened.

On the evening of the fourth day a characteristic scarlatinal eruption appeared about the buttocks, with a temperature of 100°; pulse 120. The temperature rose to 104° as the eruption spread down the legs to the feet. The involution proceeded well, and a laceration of the perineum closed by two catgut sutures, healed.

There existed at that time in Hamburg an epidemic of scarlatina of 158 reported cases. The patient had visited various parts of the city on the day before her confinement. The appearance of scarlatina so early in the puerperal period was not unusual and has been reported by Olshausen. The incubation period for smallpox and typhoid is also much shortened in the puerperal patient. It is thought that the infection remains latent in the patient until the disturbance of parturition causes it to develop.

The case of a woman who, four weeks before labor, took care of her child having scarlatina, without showing signs of disease, but who developed scarlatina three days after labor, is quoted.

Falk believes that cases of scarlatina developing in the puerperal period should be segregated from cases of puerperal sepsis, although many cases of sepsis are quoted as puerperal scarlatina. Ahlfield, in 1891, reported an epidemic of puerperal sepsis with exanthem, carried by a midwife. This epidemic was considered genuine scarlatina. Although septic lesions develop in puerperal patients who have scarlatina, it does not follow that the two diseases are identical.

In discussion, Lomer believed that a pure scarlatina infection was not especially dangerous in the puerperal period, but the danger arose from mixed infection. Among other varieties he had seen a bullous exanthem proceeding from a tear in the perineum, extending over the whole body, and especially about the joints, in a case of puerperal scarlatina. The head only of the patient remained free from the eruption, and the patient suffered from profuse diarrhea. Winkel had seen one similar case where the eruption began upon the buttocks and spread over the body, but where the head was not attacked.

¹ Zentralblatt f. Gynäkologie, 1909, No. 39.

The Examination of the Blood in Puerperal Sepsis. Lange¹ contributes a paper upon the method of examining the blood in puerperal septic infection. He paid especial attention to the freezing point of the blood in septic infection, to the resistance of the erythrocytes, and to the effect produced upon the blood by ferments derived from the pancreas in trypsin, and also the ferments from leukocytes.

He does not think that at the present time our knowledge is sufficiently exact to draw positive conclusions from this method of study. He states that a case of the severest form of puerperal sepsis which recovered after extirpation of the uterus showed a more severe involvement of the blood than another septic case in which, for purposes of comparison, the blood was taken for examination an hour before the death of the patient.

The result of his investigations showed that the study of the specific gravity and the coagulation time of the blood was not sufficiently determined, nor the resistance of the erythrocytes, nor the development of antitrypsin from the leukocytes, to give clinical data of positive value. The number of erythrocytes and the percentage of hemoglobin seemed to run parallel with the severity of the infection, but did not afford a definite prognosis. Many varieties of pathological changes are observed in the erythrocytes.

Of especial significance is the appearance of the erythroblasts, nuclear degeneration, and polychromasia.

The leukocyte curve is not conclusive in forming a prognosis. The glycogen reaction of the blood is available in rare cases only. Great changes in the eosinophiles, with relative increase in the lymphocytes, and unaltered condition in the neutrophiles, if gonococci be absent, strongly point to a previous gonorrheal infection. The eosinophiles and lymphocytes, if they progressively increase, give a symptom of favorable import. Of significant value is the determination of the specific gravity of the blood, its coagulation time, and the condition of the blood as regards eosinophiles, lymphocytes, and neutrophiles.

Hemolytic Streptococci and the Prognosis of Puerperal Sepsis. Bondy² has investigated the significance of hemolytic streptococci in 125 cases of puerperal sepsis, finding these organisms present in 59 cases, in pure culture in 51. He illustrates his paper with several curves showing the relation between the number and kind of streptococci and the condition of the pulse. His conclusion is a negative one regarding the value of the presence of hemolytic streptococci in making a prognosis in puerperal sepsis.

Sachs³ contributes an extensive paper upon the same subject. He considers the bacteriological examination for hemolytic streptococci

¹ Zeitschrift f. Geburtshülfe und Gynäkologie, 1909, Band lxiv, Heft 2.

² Monatsschrift f. Geburtshülfe und Gynäkologie, 1909, Band xxv, Heft 5.

³ Zeitschrift f. Geburtshülfe und Gynäkologie, 1909, Band lxxv, Heft 1.

in the blood and lochial secretion to be of value when taken with clinical observation, and that from the two combined, the obstetrician is aided in making an accurate prognosis. If peritonitis be present, and hemolytic streptococci are found, the prognosis is exceedingly grave. Such is also the case when thrombophlebitis is present. None of these cases recovered without operation, and the few that were saved seemed to owe their recovery to operative interference. In septic endometritis with hemolytic streptococci, operation must be performed in the early stage of the disease to be efficient. Help is given in forming an opinion as to which cases tend to recovery by studying the leukocytes. The normal leukocytosis is from 70 to 75 per cent. in relation to lymphocytes. In severe infection the percentage of leukocytes to lymphocytes and other cells in the blood rises to 90. He considers the leukocyte curve of great value in determining the development of peritoneal infection and increased parametritis.

Uncomplicated thrombophlebitis gives practically a normal leukocyte count. Endometritis and pus formation in the wall of the uterus increase the number of leukocytes very slightly. So soon as the peritoneum begins to be involved, if the resisting power of the body is normal, the leukocytes are greatly increased. A rapid increase in the leukocytes is seen after operation in which septic absorption accompanies or follows the operation.

So far as normal leukocytosis is concerned, the relation of the normal leukocytes to the neutrophiles changes rapidly so soon as general infection develops. This indicates a grave prognosis. Should convalescence be established, the proportion returns again to the normal. The lymphocytes increase and exceed the percentage in normal blood.

Three factors influence the prognosis in puerperal streptococcus infection, namely, the change in the site of the infective process, the resisting power of the organism, and the virulence of the streptococci. This latter factor can be determined by bacteriological examination. When the virulence of the germs has been demonstrated, the recognition of the other factors must be determined by clinical observation.

Sigwart¹ believes that it is necessary to establish the diagnosis of puerperal sepsis by the use of bouillon, agar, and stroke preparations. By comparing these methods, and by utilizing all three, he has been able to make a positive diagnosis of the presence of pure cultures of streptococci from the lochia and blood.

Schmidt² examined 100 cases of labor to determine the presence of hemolytic streptococci before labor and during the puerperal period. His examinations were made from the vaginal secretions. In pregnant women he found them present in 7 per cent.; in puerperal women in 68 per cent. It could not be proved that they were the sole cause of puer-

¹ Zentralblatt f. Gynäkologie, 1909, No. 15

² Ibid., No. 42,

peral fever, for this may arise from the presence of other germs. Hemolytic streptococci are not more apt to produce fever than are other bacteria. When fever occurs without hemolytic streptococci, it usually develops from the sixth to the eighth day of the puerperal period. Fever from the third to the fifth day is more often the result of streptococci. Autoinfection from hemolytic streptococci before birth does not seem probable. He found no virulent germs in the genital canal before labor.

To positively demonstrate autoinfection in severe sepsis it would be necessary to isolate bacteria before labor and during the puerperal period in women who had no vaginal examinations during pregnancy or labor.

Kirstein¹ draws attention to the difficulty of making exact observations upon the blood in determining the prognosis of puerperal sepsis. Unless minute observations can be made under exactly similar circumstances, and in the same period of the disease, he does not believe that a prognosis can be based upon this method.

The important fact is the resisting power of the organism, and that we have no precise means of determining. He doubts very much the ability of obstetricians to play the rôle of prophet.

Scheidler² reports a case of abortion curetted by the attending physician in which a chill developed after operation. Upon examination, a perimetrix exudate was opened through Douglas' cul-de-sac and pus evacuated. The right hip became affected and an abscess formed in the gluteal region containing foul pus with bubbles of gas. The patient died of septic infection, autopsy showing no peritonitis but infection by the *Bacillus aerogenes capsulatus*. He also reports two fatal cases of a similar infection occurring after labor, one in which version and extraction was performed, the other after spontaneous labor with profuse hemorrhage.

In both these cases during the life of the patient there was no accumulation of gas in the uterus, no escape of gas from the vagina, and no evidence of the infection in the condition of the amniotic liquid when the child was extracted, nor in the condition of the body of the fetus.

It is known that this bacillus is found in the intestine as well as in the vagina, and that these cases usually occur after prolonged abortion or labor. In both cases postpartum hemorrhage was severe. In the first case a diagnosis of death from air embolism was made.

In the two cases of labor Fränkel's bacillus was found in the tissues, and, in the case of abortion, a *Streptococcus pyogenes longus* of the hemolytic variety, the *Bacillus coli communis*, and later, from the abscess, a pure culture of Fränkel's bacillus. He also quotes 5 cases observed by Stade in the Bacteriological Institute, in which this bacillus was isolated from pus and septic tissues.

¹ Archiv f. Gynäkologie, 1909, Band lxxxix, Heft 2.

² Monatsschrift f. Geburtshilfe und Gynäkologie, 1909, Band xxx, Heft 6.

The Immunization of Puerperal Women against Septic Infection. Czyzewicz¹ reports his investigations with Rosenberg's phagocytin. He found that in cases in which neither the hands nor instruments had been introduced into the uterine cavity, and in which the temperature never rose above normal, that subcutaneous injections of phagocytin made the development of septic infection but half as frequent as normal. In septic cases these injections seemed to delay the outbreak of the disease.

In suspected cases, with a temperature above normal, but lower than 100° F., these injections were useless and seemed to do the patient harm. These injections were also contraindicated in cases with higher temperature.

If this method is useful, it must be purely in prophylaxis. In the treatment of infection it seems to be useless. It is indicated in private practice where it seems probable that its use would lessen septic mortality, and especially in cases requiring operation.

The Treatment of Puerperal Septic Infection. THE TREATMENT OF RETENTION OF PLACENTAL FRAGMENTS WITH THE DEVELOPMENT OF FEVER. Veit² reported before the Obstetrical Society of Leipsic several interesting cases in which pieces of placenta had been retained after labor and fever had developed.

His clinical experience has led him to conclude that in these cases a microscopic and bacteriological examination of the vaginal secretion should be made. If no streptococci are found but the bacteria of putrefaction, the obstetrician should proceed to remove the placental fragments as soon as possible. If virulent streptococci are found in the vaginal secretion, but are not present in the blood, no interference whatever should be practised. If streptococci are found in the lochial secretion, but not of a virulent character, the retained placental fragments should be removed. Where, however, virulent bacilli are found in the blood and in the vaginal secretions, the attempt to remove placental fragments, or to perform extirpation of the uterus, both give a very unfavorable prognosis.

THE TREATMENT OF PUERPERAL SEPSIS WITHOUT OPERATION. Von Herff, at the *International Congress at Budapest*, laid stress upon the non-operative treatment of puerperal sepsis, and considered of the greatest importance the effort to produce hyperleukocytosis. Abscesses must be opened, but it is not yet definitely determined that ligation of thrombosed veins is of value.

Bumm would carefully avoid interfering with the endometrium in streptococcic infection. If the abdominal removal of the uterus seemed indicated, he would take special pains to avoid bringing in contact infected tissue and fresh wounds. Septic involvement of the adnexa should not be disturbed, if possible, and if the necessity for interference

¹ Archiv f. Gynäkologie, 1909, Band lxxxix, Heft 3.

² Zentralblatt f. Gynäkologie, 1909, No. 32.

arose, operation through the vagina is to be preferred. To establish a diagnosis, exploratory incision through the vagina is recommended. In the acute form of thrombophlebitis with streptococci, causing pyemia, ligation of the veins of the broad ligaments is useless; and in the chronic form recovery may occur without operation. If the operator can locate the thrombosis he should try to attack it through the extraperitoneal route. If possible, all four veins should be ligated, and where the affection is upon one side only, the common iliac vein as well. If a transperitoneal operation is decided upon, the thermocautery should be used. In the treatment of pyemia, hysterectomy is useless.

Pinard had obtained the best results by conservative constitutional treatment. Since 1896 he had employed serum therapy with advantage.

Barsony, in 2736 puerperal cases, had lost 2 from septic infection. His treatment consisted of absolute rest with stimulation and forced feeding. He also employed vaginal douches.

Latzko believed that most puerperal septic cases died of peritonitis. The condition of the intestine, and not the state of the pulse, should determine the indication for operation. In 80 cases operated upon, 17 recovered; in 13 extirpations of the uterus for metrophlebitis, 5 recovered.

In attacking thrombosed veins he preferred the extraperitoneal route. He considered attempts at bacteriological diagnosis useless, but he would operate upon all cases having for twenty-four hours a continuous temperature above 103° F.

THE TREATMENT OF THE GRAVER FORMS OF PUERPERAL SEPSIS. Wilson¹ believes that the mortality from puerperal sepsis in England and Wales is probably 10 per cent. He would wash out the uterus thoroughly with iodine solution as soon as fever develops. Digital evacuation of retained portions of placenta is indicated. Quinine, 10 grains, twice daily in suppositories, has given good results; strychnine hypodermically, alcohol by mouth, sponging, and forced feeding are indicated. Saline enemata, 8 ounces every four to six hours, or hypodermoclysis, are indicated.

He has seen no benefit from serum. He employed a vaccine prepared from streptococci in a case which had not improved under injections of collargol, antistreptococcic serum and other treatment. Soon after the first injection abscesses appeared in the cellular tissues of the body, and as each abscess was opened the patient improved. Recovery speedily followed.

Radical operations for puerperal sepsis, in his experience, have been of little value. Incision and drainage is indicated, and hysterectomy should be performed in sloughing fibroids, rupture, and suppuration of the uterine wall. Infected uterine appendages should be removed. Ligature and excision of veins is indicated only where the patient's

¹ British Medical Journal, October 9, 1909,

general condition is good, and the pulse still strong. The intraperitoneal route is more thorough and satisfactory because it gives opportunity for examining and ligating all four groups of veins.

In discussion, Fehling would make a sharp distinction between sapremia and streptococcic infection. He has begun the use of vaccines in pregnancy for prophylaxis, and in severe cases of sepsis, but he had not sufficient experience to form a judgment. He would not interfere with the uterus during the first week of the puerperal period except to practise one irrigation in cases of high fever. He would examine the secretion of the uterus, and if streptococci were found he would not expect good results from irrigation. Extirpation of the uterus has a mortality of more than 50 per cent.

In peritonitis, he made one median incision and two in the flanks, introducing drainage tubes, but not flushing out the peritoneal cavity. Occasionally ligation of the veins gives good results.

Murdock Cameron had never seen death from sapremia where the patient was treated early by removing all debris, swabbing out the uterine cavity, and then applying camphor and carbolic acid, rubbed down sufficiently to liquefy the crystals of carbolic acid. In septicemia he had good results from serum treatment.

Munro Kerr was among the first to practise expectant treatment after first exploring the uterus, removing debris with the fingers and gauze, and douching the uterine cavity. Acute puerperal peritonitis he believes nearly always fatal. Surgical treatment in opening abscesses was of value. Serum treatment had given him no good results, but he believed that vaccines promised better. Chronic cases would certainly often be benefited by vaccines.

In discussion, others called attention to the value of incising the posterior vaginal fornix, and introducing iodoform gauze for drainage. In peritonitis, drainage tubes in the abdomen and continuous rectal irrigation were of value.

The general opinion was that vaccines should receive a thorough trial.

Watkins¹ reported 61 cases of septic infection, most of them severe; 6 were suppurative peritonitis. The leukocyte count varied from 5000 to 58,000, in proportion to the amount of febrile disturbance. Gonococci were found in only 3 cases. In unavoidable abortion the uterus and vagina were packed with sterile gauze until the contents of the uterus were expelled spontaneously. If no hemorrhage or offensive discharge followed, the uterus was considered empty. If the uterus is packed and drained, he considered the retention of secundines as not dangerous. All other interference with the uterus or vagina should be avoided.

¹ American Journal of Obstetrics, September, 1909.

In cases of pelvic exudate, the uterus was not explored. The peritoneum was considered involved when there was pain. Vaginal section was made in 8 of the 61 cases; abdominal section was done in 3 cases. The treatment was directed principally to increasing the patient's physiological resistance. Forced feeding, sun baths, and fresh air, an ice bag over the abdomen for pain, and the administration of codein or morphine to procure sleep, gave good results. Of the 61 cases, 54 recovered and 7 died.

THE PROPHYLAXIS OF PUERPERAL INFECTION. Cuzzi¹ reports from Pestalozza's clinic in Rome 2405 cases exclusive of abortions and Cesarean section, with 1 death from puerperal sepsis. He ascribes this low mortality rate to the strict observation of antiseptic precautions in the clinic.

THE SURGICAL TREATMENT OF PUERPERAL SEPSIS. Koblanck² reports the results of treatment in 484 cases of puerperal sepsis: 100 had severe infection. Clinically it was not possible to separate the cases into septicemia and pyemia; 34 cases were treated by collargol. General peritonitis was divided into three groups:

First, perforation peritonitis, usually caused by the *Bacillus coli communis*, characterized by great abdominal tenderness and distention, calling for prompt operation. Abdominal extirpation of the uterus was done once successfully; 2 other cases not operated upon died.

The second variety of peritonitis developed slowly and with the formation of an encapsulated abscess. In this, leukocytosis increases rapidly and is of value in making a diagnosis; 3 of these cases were operated upon, one successfully.

The third variety is the peritonitis which develops rapidly in its most virulent form, usually from genital infection; 5 of these cases were operated upon; one recovered.

In operating, adhesions are loosened, pus is removed by irrigation, drains are inserted, and permanent irrigation with warm salt solution is practised. In thrombophlebitis an early diagnosis is essential. The leukocyte curve approaches the normal and helps to diagnosticate these cases from parametritis and peritonitis. Ligation of the veins has four results: Limiting the extension of the thrombus to the vena cava, preventing the dislodgment of thrombi, limiting infection to the uterus, and limiting the spread of bacteria. The veins should not only be ligated, but removed. In 6 cases, 2 recovered.

This operation is indicated only in those cases in which the uterus remains healthy. The uterus was extirpated for sepsis 15 times, with 6 recoveries and 9 deaths. Hemolytic streptococci were present in these cases.

Metastases in the heart, lungs, and eyes give an unfavorable prognosis.

¹ *Annali di Ostetricia*, August, 1909.

² *Zentralblatt f. Gynäkologie*, 1909, No. 46.

In 19 patients having septic infection of the heart, 2 recovered; in 8 with infection of the eyes, but 1 recovered; in 55 with severe infection of the lungs or pleuræ, but 9 recovered. The resisting power of the organism is of great value.

If total extirpation is to be practised at all, it must be done in cases of general sepsis, or in those in which the uterus has just become involved. Of the first class where various organs were involved, 11 patients were operated upon, with 3 recoveries. In the second group, 4 operations were performed, and all 4 recovered.

It could not be certainly determined that some of these patients might not have recovered without operation. Where the operator thinks that the infection is limited to the uterus only, vaginal extirpation may be indicated. If there is reason to suspect infection of other organs, abdominal operation must be done.

Before the German Gynecological Society, Waltherd¹ has seen no good results from the use of serum in puerperal sepsis. He considered the plentiful introduction of water into the patient's body of considerable value.

Winter expressed a very conservative opinion regarding the local treatment of puerperal sepsis. Bumm believed that operative treatment in acute sepsis is useless, but that in streptococcus endometritis early extirpation of the uterus was indicated. Abscesses should be opened, and in pyemia an effort should be made to ligate the veins.

LIGATION OF THE PELVIC VEINS FOR PYEMIA. Runge² concludes a summary of the treatment of puerperal septic infection, with a review of our present knowledge concerning this operation.

Introduced by Trendelenburg, Bumm took up the operation and urged that it be performed when it could be shown that infection proceeded from the pelvic veins. To diagnose this accurately he advises thorough examination under anesthesia. He was thus able to distinguish hard masses at the side of the uterus which were the enlarged veins surrounded by granulation tissue. Bardeleben agreed with Bumm as to the importance of examination under anesthesia. Bumm prefers the abdominal route for the operation, and believes it better to ligate the veins without excising them, except the superficial spermatic veins, which are easily accessible. In chronic pyemia he advises the transperitoneal operation, and, in acute cases, the incision in the flanks to avoid the danger of communicating infection to the peritoneum.

Opitz, from the material in Olshausen's clinic, does not consider the prognosis of pyemia so desperate that it justifies a dangerous operation like excision of the veins. The difficulty lies in making an early diagnosis, when the cases are in a condition favorable for operation.

Lenhartz has operated for this condition as soon as he could diagnos-

¹ Zentralblatt f. Gynäkologie, 1909, No. 28.

² Monatsschrift f. Geburtshülfe und Gynäkologie, 1909, Band xxix, Heft 6,

ticate thrombosis on one side, ligating the spermatic veins, and in some cases the hypogastric, iliac, and saphenous. In his cases the infection was upon one side only, and in addition to the lesions near the uterus he found masses in the vaginal connective tissue at the sides, which served to establish the diagnosis. He would limit the operation to one side of the pelvis, believing that the double operation would consume too much time, which would not be borne by the patient.

Seitz, in 37 cases, found the results so good as to justify the operation, provided it is limited to ligation, and resection of the veins is not undertaken unless collections of pus are found in the veins which threaten rupture. The extraperitoneal abdominal method is to be preferred.

Bumm would ligate all four veins in cases of double infection, including the hypogastric. If the median iliac vein is involved it should also be ligated. The anatomy of these veins has been studied by Kownatzkis, who found that in some cases periphlebitis so thickened the tissues that difficulty was experienced in freeing the veins. If a vein is pierced with a sharp needle the operator must avoid the lumbosacral nerve trunk which lies beneath it, as this contains the fibers of the ischiatic nerve.

Berkowsky operated three times successfully by ligating the spermatic veins with the transperitoneal method; 4 cases of pyemia in which operation was not performed died; 2 of these had severe septic and diphtheritic infection of the womb with thrombosis of the hypogastric veins. He believes that operation should be done on the third day after pyemia develops, if other methods of treatment have not been successful.

Wormser collected 43 cases, with 16 recoveries and 27 deaths. The difficulty lies in choosing the time for operation. Haeckel operated once successfully in chronic pyemia, and once without success in acute pyemia. Latzko operated successfully upon a case of puerperal sepsis by ligating the thrombosed spermatic veins, the temperature falling eight days after the operation, and recovery ensuing in two months.

The many conflicting opinions upon the treatment of puerperal septic infection show that much is yet to be learned concerning this interesting and practical subject. It is universally agreed that beyond emptying the infected uterus in the gentlest possible manner, no interference with the infected womb except its extirpation should be practised. Repeated douching, vaginal and intrauterine, and repeated curetting, are contra-indicated.

The development of acute peritonitis justifies exploratory incision and drainage. This is to be followed by the continuous instillation of salt solution by the rectum, or, if the local conditions favor, through drainage tubes in the abdomen. The removal of the pelvic viscera is a doubtful expedient, as in blood infection it is usually practised too late to be of value, while in mild cases the operation may not have been necessary. A pronounced leukocytosis is a favorable sign and inclines to a favorable prognosis for operation. The absence of leukocytosis,

with repeated chills, indicates a profound blood infection in which operation is useless.

When a positive diagnosis of thrombosed pelvic veins can be made, the attempt to ligate or extirpate them is justifiable if the patient be otherwise in good condition. If she be prostrated by the infection this attempt will hasten a fatal issue.

Aid will be given in forming a decision under these circumstances by the examination of the blood and the presence or absence of acute pernicious septic anemia. Abscesses should be opened whenever they form by the route which offers the best drainage. Pelvic abscesses should be opened through the posterior vaginal fornix; abdominal abscesses should be drained through the posterior vaginal fornix, and in the lowest points of the lateral portions of the abdomen; joint abscesses should be incised and drained as they occur.

Of primary importance is the maintenance of the patient's physiological powers of resistance. Forced feeding, stimulation by the use of cold and by alcohol, with tonic doses of strychnine, are indicated. Abdominal pain is best controlled by the application of cold. Care must be taken in introducing salt solution into the veins or subcutaneous tissues that an overburdened heart is not weakened by the rapid introduction of a considerable quantity of fluid.

The prevention of puerperal septic infection is a constant theme for discussion in European societies. It is recognized that obstetric operations should be performed in hospitals, if possible, and that the same thorough technique which guards the surgical patient should be available for the parturient woman. Midwives educated and licensed by the government are strictly forbidden to undertake operative procedures in private houses. General practitioners are urged to summon a consultant as soon as the necessity for operation arises, and that the patient be conveyed to hospital if possible. In some European countries antisepsis and asepsis have not been practically successful in greatly lessening the mortality from puerperal septic infection in private houses. The explanation for this lies in the fact that the general practitioner is not in a position to use asepsis and antisepsis thoroughly in his attempt to perform obstetrical operations in private houses.

In America, the mortality from puerperal septic infection in private houses has not been greatly lessened by antisepsis and asepsis. We have few competently trained midwives who are strictly limited in their attendance upon parturient women. General practitioners must necessarily deal with all cases of disease, infectious and otherwise, and are not in a position to render to the parturient woman the necessary skill and technical equipment which a complicated labor demands. In view of the fact that we have no license which controls midwives who attend normal cases among the poor, the need for hospitals for obstetric work is especially great. Private patients who require complicated or difficult

obstetric operations should enter hospitals unless they can be attended by an obstetrician with the necessary appliances for surgical technique. Medical students at the present time are taught as thoroughly as possible to recognize those conditions which can only be successfully managed in hospitals. Our hope of lessening puerperal septic mortality in private houses lies in the direction of reform in obstetric practice and in the recognition of obstetrics as a specialty.

OBSTETRIC SURGERY.

The Rapid Dilatation of the Cervix Uteri. At the recent International Congress in Budapest, Bar¹ believed that low attachment of the placenta, contracted pelvis, and a very large child, are contraindications for rapid dilatation of the cervix uteri. If the indication arises for the speedy termination of labor and the condition of the cervix is unfavorable for dilatation, delivery must be effected by abdominal section. If the mother is infected, and the circumstances are favorable, the cervix may be rapidly dilated, and when this would be dangerous, extraperitoneal section should be performed. The condition of the child must be taken into account in making this decision.

He calls attention to the fact that rapid dilatation of the cervix must not be confounded with accouchement forcé. In dilatation of the cervix great care must be exercised that dilatation be sufficiently complete to make the extraction of the child possible without dangerous laceration or damage to the fetus.

Bossi reported a tabulated series of 365 cases of cervical dilatation by his method. In a separate table he had collected cases of rapid labor and section in placenta prævia, and premature separation of the placenta, the statistics seeming to indicate that section has doubled the mortality for the mother that is obtained in dilatation of the cervix, with but one-fourth the mortality for the child.

In a third table he compares the results of dilatation and extraction in eclampsia for mother and child. His conclusions favor the use of his dilator followed by extraction.

Winter called attention to the limitations in the use of Bossi's dilator. He would only employ it in cases in which the external os is as large as a dollar and in which the use of the instrument would not cause dangerous cervical tears. In primiparous patients he believes that incision of the cervix is safer. He believes that in appropriate cases vaginal Cesarean section, in the hands of a skilful operator, is a comparatively safe and successful operation. The necessity for the speedy termination of pregnancy he believes arises in eclampsia, in separation of the placenta,

¹ Zentralblatt f. Gynäkologie, 1909, No. 40.

placenta prævia, disease of the lungs, kidneys, and heart; fever occurring during labor, stenosis of the cervix, and death of the mother during labor. In most of these conditions vaginal Cesarean section, he believes, is to be preferred. Eclampsia he considers the most frequent and important indication for rapid dilatation of the cervix.

Gauss reported 75 cases of dilatation of the cervix by the Bossi dilator, and 50 cases of vaginal Cesarean section. The latter operation he considers especially indicated in primiparæ. One patient died after a Bossi operation, having suffered from severe lacerations of the cervix. He would use Bossi's dilator in early pregnancy or at the end of pregnancy when the conditions for dilating the cervix were favorable. Vaginal Cesarean section in hospital is indicated in these cases, but placenta prævia furnishes a contraindication for rapid dilatation and vaginal section.

Obstetric Operations with Undilated Cervix. Pfannenstiel¹ urges the value of dilatation of the cervix by elastic bags in the hands of the general practitioner. He believes that the maternal mortality of placenta prævia can be reduced in this manner to 5 per cent., and the fetal mortality to 20 or 25 per cent.

The advantage of this treatment lies in the fact that it controls hemorrhage and prepares the way safely for delivery. When, however, the patient has been reduced by hemorrhage, Pfannenstiel considers her in the same conditions as a patient who has bled profusely from ruptured ectopic gestation. He would treat such cases by abdominal section followed by the total extirpation of the uterus.

The Results of Various Methods of Cervical Dilatation. Bar² gives the results of 171 patients pregnant eight months or more, in whom the cervix was dilated as rapidly as possible by de Rieb's bag. The maternal mortality was 4.09 per cent.; the infant mortality was 37.40 per cent.

The conditions for which this method was selected were death of the mother in labor, the child surviving; serious heart lesions of the mother, retroplacental hemorrhage, eclampsia, prolapse of the cord, shoulder presentation with premature rupture of the membranes, and hemorrhage from abnormal attachment of the placenta.

In digital dilatation of the cervix he found that 30 in every 100 cases suffered from considerable lacerations of the cervix; 2 out of 100 cases died of hemorrhage.

Bonnaire, in 159 cases of digital dilatation of the cervix, had a maternal mortality of 18.8 per cent. and a fetal mortality of 41 per cent. Bonnaire estimates that severe lacerations of the cervix occur in 16 per cent. of these cases. In 13 cases in which Bossi's dilator was employed, one maternal death followed.

De Rieb states that he does not advise the employment of the dilating

¹ *Monatsschrift f. Geburtshülfe und Gynäkologie*, 1909, Band xxx, Heft 5.

² *L'Obstétrique*, September, 1909.

bag devised by him when the cervix is rigid and not dilatable, either from cicatricial tissue, cancer, tumors of the cervix, chancre, or anatomical lesions, spasm of the cervix, or œdema of the cervix and lower uterine segment.

Regarding digital dilatation, Bonnaire believes that it is difficult to maintain asepsis during this procedure, that the hand of the operator loses its strength and skill, and that it is difficult to know when the cervix is dilated sufficiently to avoid severe lacerations during extraction. He employs bimanual dilatation whenever necessary, and does not consider digital dilatation an operation of choice.

Dilatation of the Cervix by Forceps Devised for this Purpose. Wendel¹ describes a narrow-bladed forceps with a pelvic curve which he has devised for dilatation of the cervix.

This forceps contains but two blades with blunt extremities and carefully rounded edges. The blades are parallel and straight, and when closed the forceps is about the size of a medium-sized laminary tent.

He also describes the curette or placental forceps which he has used to advantage in emptying the uterus in early pregnancy and for extracting retained portions of placenta.

Extraction of the Undescended Breech with Breech Forceps. Eisenstein² describes a forceps which he has devised for application to the breech when descent fails in breech presentation.

The instrument is composed of three blades, two of which are inserted on the crests of the ilia, the third along the sacral region of the fetus. The third blade is movable upon the others and is fastened in position by a binding screw. When the back is anterior the shank of the forceps lies parallel to the spinal column, the blades resting over the crests of the ilium. When the back is posterior, one blade of the forceps will be obliquely posterior and one obliquely anterior. The upper or movable blade can be fastened in the slot, and the lower by a binding screw, thus affording a firm grasp.

The instrument has been used several times successfully.

The Forceps Operation with an Improved Instrument. McDonald³ calls attention to the necessity for aseptic technique in forceps operations in private houses. He urges that the patient be placed upon a suitable table upon a Kelly pad, and that the lower limbs and genital tract be covered by aseptic linen. He uses izal 1 to 500 as an antiseptic, chloroform as an anesthetic, and has modified the Tucker-McLane solid-bladed forceps by shortening the blades, widening the tips, and making a number of transverse fenestræ in the body. He asserts that the fenestræ do not detract from the strength of the forceps nor the ease of application,

¹ Monatsschrift f. Geburtshülfe und Gynäkologie, 1909, Band xxix, Heft 6.

² Zentralblatt f. Gynäkologie, 1909, No. 3.

³ American Journal of Obstetrics, February, 1910.

and adds considerably to the gripping power of the instrument and lessens the danger of slipping. He produces axis traction by using the two hands in pulling upon the forceps, and removes the forceps just before the delivery of the head to avoid lacerations.

Indications for the Use of Forceps and the Prognosis of the Operation. Zernik¹ reports 396 forceps operations in 1423 labors, or 27.7 per cent. The Naegele forceps was used in the majority of cases. The high application was made but six times. The operation was not undertaken unless positive danger to the life of the mother or child developed.

In uterine inertia the forceps were not applied in primary inertia but only when secondary and pronounced failure of uterine contractions developed. The operation was performed in the interests of the mother 133 times; in the interests of the child 227 times; and in the interests of both mother and child 36 times.

In first position, vertex presentation, there were 193 operations; in second position, vertex presentation, 100; in transverse position of the head, 73; in brow presentation, 14; and in face presentation, 16. There were 36 contracted pelves.

The mother sustained lacerations in 53.5 per cent. of cases. The cervix was extensively torn eight times, and there were 21 cases of severe lacerations in the cervix and perineum.

There were two maternal deaths, one from heart disease and one from eclampsia. There were 13 cases among the mothers in whom the puerperal period was complicated. The absence of septic infection is ascribed to the routine use of rubber gloves.

Among these patients were 30 cases of postpartum hemorrhage, none of them severe, and the placenta was removed by the hand 6 times. The fetal mortality was 4 per cent.

Version and Extraction in Transverse Presentation. Schultze² questions a recent statement of Buechler that in Germany 400 mothers and 2000 children die each year from transverse presentation of the child in labor.

He calls attention to the statistics showing that the transverse position of the child develops during labor in 7.5 cases in each 1000.

Schurig's statistics show that in 655,770 cases of labor, 5041 had transverse presentation of the child, that is, 7.69 to the 1000.

Recent statistics at Hamburg give a frequency of 7.255 to each 1000.

It is estimated that in Germany during the preceding year 2,000,000 living children were born. The mortality rate among these was 30 to each 1000. If the frequency of transverse presentation be reckoned as 7.5 to each 1000, there would be among these cases 15,450 labors with transverse presentation. The maternal mortality in these cases receiving no assistance is estimated at 95 per cent.; the fetal mortality at 99.9 per

¹ Zentralblatt f. Gynäkologie, 1909, No. 47.

² Monatsschrift f. Geburtshilfe und Gynäkologie, 1909, Band xxx, Heft 2.

cent. Practically, the cases in which mother and child survive recover as the result of treatment.

The statistics at Hamburg show that 389 children to each 1000 children were born dead. This makes 6010 children lost through transverse presentation each year in the German empire. Statistics then show that 4000 children, deducting those which are born in a macerated condition, are stillborn each year in the German empire as the result of transverse presentation.

When the causes of fetal death in this condition are analyzed, it is found that extraction by the feet is the principal cause for this mortality. When version has once been accomplished the spontaneous birth of the child is much safer for mother and child than is forcible extraction by the feet. The obstetrician in uncomplicated transverse presentation should wait until the cervix is completely dilated before proceeding to version.

In 238 cases in Schröder's clinic, in which care was taken to secure complete dilatation before version, but 5 of the children were lost. In 18 cases in which the cervix was but partly dilated, 9 of the children perished. In undilated cervix, Cesarean section, in some of its modifications, should be selected.

Schultze calls attention to the direction usually given in the conduct of breech labors, that so soon as the umbilical cord presents, a loop should be grasped with two fingers and withdrawn from the mother's body. This he does not believe to be good practice because he does not think that it lessens the danger of compression. If the fetal heart sounds or the cord pulse becomes poor, and respiratory efforts develop, extraction should be terminated as soon as possible. He believes that the cord should be let alone under these conditions and that less danger to the child will result.

Version Combined with the Use of Elastic Dilators. Rieck¹ states that in version maternal mortality results, in placenta prævia when the tampon is employed and version is performed before the cervix is thoroughly dilated. He describes the case of a patient who had severe hemorrhage in whom the cervix was sufficiently dilated to admit three fingers, with which combined version was performed. The cervix was gradually dilated until the entire hand could be introduced, when version was completed and the body of the child brought down. It was spontaneously expelled stillborn. After the expression of the placenta, bleeding was so severe that a fatal result was feared.

Upon examination, the cervix was found torn on both sides into the pelvic tissue. The prompt closure of these lacerations completely checked the hemorrhage.

He advises the use of an elastic bag 15 cm. in diameter, securing sufficient dilatation to make version and extraction safe, and also urges

¹ Zentralblatt f. Gynäkologie, No. 28, 1909.

the importance of thoroughly tamponing the uterus as soon as it is emptied.

Embryotomy. THE APPLICATION OF KÜSTNER'S RHACHIOTOME. Küstner¹ describes the case of a multipara, aged twenty-nine years, who developed, during labor, transverse dilatation of the uterus with transverse position of the fetus and prolapse of the cord. The child was dead. It was impossible to push the fetal shoulder up from the pelvic brim, and the neck of the fetus could not be reached. The arm had prolapsed and this was fastened with a sling given to an assistant. The thorax of the fetus was then opened by a perforator, the arm of the child carried strongly outward and upward, and through three fingers of the left hand the cutting portion of the rhachiotome was passed through the opening in the fetal thorax. The two blades of the instrument were then introduced along the sides of the fetal body, and by tightening the screw the vertebral column was easily severed, and the instrument was then withdrawn.

It was then reintroduced, and the upper ribs severed, and with a third application the left arm at the shoulder was removed.

When traction was made upon the right arm the lungs prolapsed and were removed with scissors. The head of the child was then brought down and the breech was readily delivered.

The mother refused to take an anesthetic during the operation, which consumed fifteen minutes. The fetus was 50 cm. long, and weighed 2700 grams.

Abortion. THE TREATMENT OF ABORTION. In *Surgery, Gynecology, and Obstetrics*, January, 1910, Stowe analyzes 750 cases of abortion occurring in the outpatient department of the Chicago Lying-in Hospital. He does not give the mortality and morbidity of these cases, but states many different sorts of treatment, calling attention to many methods of treatment which are not employed in this country.

These patients were cared for in their homes. The sanitary surroundings in most of the places were unfavorable for treatment.

There were 276 cases of threatened abortion, or 36.81 per cent. Among these, no internal examination was made in 95 cases, or 34.4 per cent.

The patient was placed in bed at absolute rest, and given morphine and codein every four hours. The bowels were moved by salines, and if the uterus was displaced it was put in a proper position. Under this treatment pregnancy was saved in 72.8 per cent. of the cases. It was sometimes difficult to get the patient to remain in bed long enough, and of 75 cases in which pregnancy terminated, 16 women left their beds before the bleeding ceased; 48 per cent. of the women who finally miscarried gave a history of previous abortion, pointing to endometritis.

¹ Zentralblatt f. Gynäkologie, 1909, No. 42.

The great majority of those in whom the pregnancy went on gave no history pointing to previous uterine disease.

When the cervix was closed and the fetus and decidua were in utero, and hemorrhage occurred, the condition was treated by tampon. In more than one-fourth of the cases the ovum was found expelled when the tampon was removed, and further treatment was unnecessary. In about one-half of the cases the separated ovum was removed by the hand, while in about one-fourth of the cases the curette was employed. When the cervix was dilated and the fetus and decidua in utero with hemorrhage, the uterus was emptied by the finger, if possible, or by forceps or the curette.

The greatest number of inevitable abortions occurred where the cervix was closed, the fetus expelled, and the decidua retained with hemorrhage. These were treated by packing, with curetting with the finger if possible. In the majority of cases the finger was insufficient, and the curette was employed. In chronic abortion, the curette was used in all cases. Where the abortion could be proved to be complete, no local treatment was given, but the patient was treated by ergot and hydrastis. Blighted ova were found in 12 cases, 3 being degeneration of the chorion. The remainder were blood moles.

These operations were performed by resident physicians, and no history of perforation of the uterus is recorded. All of the mothers recovered; 62 per cent. of the patients had a normal temperature; 23 per cent. had a slightly elevated temperature; 3.2 per cent. had fever; and but 0.4 of 1 per cent. had considerable or high fever. Ergot was given only in those cases in which septic infection was present, or where the patients had lost considerable blood and the uterus was soft and relaxed.

From these cases and the review of the literature it is considered important to treat all cases of uterine hemorrhage accompanied by intermittent pelvic pain in women of child-bearing age, as acute abortion. In threatened abortion, absolute rest in bed is imperative. Blood loss should always be prevented to avoid a long period of anemia and prostration. Cotton pledgets are considered a better material for tampons than strips of gauze, as the cotton makes firmer pressure. Whenever possible, the emptying of the uterus should be done by the finger or by bimanual removal of its contents. Under favorable conditions, the uterus may be emptied by abdominovaginal compression. Laminary tents are difficult to sterilize, and steel dilators and sounds may produce perforation of the uterus. In acute abortion, the steel curette is especially liable to cause perforation. In chronic abortion the danger is less. Curetting should always be done as a surgical operation with surgical precautions. The operation is not indicated when the uterus is empty. After the uterine contents have been discharged, the use of ergot is indicated. In septic cases, when the infection is limited to the uterine cavity, the uterus may be emptied and disinfected. When the infection

has spread to the peritoneum or adnexa, it is best to avoid interference with the uterus.

In the reviewer's experience, all cases of uterine hemorrhage accompanied by intermittent pelvic pain in a woman of child-bearing age, cannot be safely treated as cases of abortion. Ectopic gestation often produces these symptoms, and the treatment of abortion in such a case might cause the rupture of a tubal pregnancy and result in very serious intra-abdominal bleeding.

The diagnosis of intrauterine pregnancy must first be made before the operator proceeds to treat the patient for abortion. In my experience, perforation of the uterus with a steel curette happens more frequently in chronic abortion with septic infection than in acute abortion in an uninfected uterus. We fully agree with the writer in the statement that curetting should be raised to the dignity of a surgical operation.

Two Cases of Abortion Followed by Cervical Vaginal Fistula. Pawlow¹ reports the case of a primipara admitted to the hospital for pain and hemorrhage. A two-months pregnancy was present. The external os did not dilate, but pain was severe and there was profuse hemorrhage.

On the posterior vaginal wall there developed an opening through the overstretched cervix into the uterine cavity. This observation was confirmed by visual inspection through a speculum. Under anesthesia the uterus was emptied through the laceration, the cervical portion remaining intact and was severed, the edges trimmed, and the wound brought together. The uterus was tamponed with gauze. The patient made an uninterrupted recovery.

The second case was that of a primipara three months pregnant, admitted to the hospital with moderate hemorrhage. The external os was closed. Shortly after admission the patient was taken with very severe and painful uterine contractions. Profuse hemorrhage developed, which was treated by the application of the tampon. Some time after, as the bleeding had saturated the tampon, it was removed, when an intact ovum with blood clots was found in the vagina.

Upon examination, the external os did not admit the finger, and a laceration on the posterior wall of the cervical portion of the cervix had occurred, which admitted the finger to the uterine cavity. This opening could be plainly distinguished by the use of the speculum. Under anesthesia this opening was closed as in the previous case. The patient made a good recovery.

Nine cases were collected from the literature, in some of whom it was thought that the cervix had been rendered undilatable by previous syphilis.

The Frequency of Obstetric Operations. Tsuji² reviews the frequency and results of the different obstetric operations.

¹ Zentralblatt f. Gynäkologie, 1909, No. 48.

² Archiv f. Gynäkologie, 1909, Band lxxix, Heft 3.

In the use of the forceps he finds a marked diminution in the frequency of forceps operations in the last few years. The forceps is now used more frequently to relieve the mother from threatened danger, when fever, prostration, and beginning development of the contraction ring indicates the necessity for interference.

In the interests of the child, the forceps is used less frequently than formerly because other obstetric operations are safer for the fetus. Most forceps operations are performed upon patients between the twentieth and thirtieth years. Primipara above the average age form 9.74 per cent. of all forceps operations.

The principal use of the forceps is to terminate prolonged labor in the interests of the mother, when continued birth pressure threatens the integrity of her tissues. The mortality of the forceps operation itself has been reduced to 0.41 of 1 per cent. in recent years, and this occurred through hemorrhage. In the puerperal period, the mortality was 0.83 of 1 per cent. from sepsis. The general mortality was 1.58 per cent. from all causes. The general mortality for the mother was 14.4 per cent.; for the child the mortality was 13.63 per cent. The high application of the forceps was practised in 2.69 per cent. of cases, with a maternal mortality of *nil*, and a morbidity of 41.1 per cent.; the fetal mortality was 35.2 per cent.

Version was performed in 1.75 per cent. of cases for transverse presentation and other recognized causes. The operation was not done for placenta prævia, eclampsia, and contracted pelvis as frequently as in former years. The mortality rate of version itself was 0.51 of 1 per cent. From all causes, the general maternal mortality rate for version is estimated at 4.7 per cent.; the maternal morbidity, 12.5; for the children, version had a mortality of 36.9 per cent.

Perforation was done upon the living child in 0.19 per cent. of cases, and 0.36 per cent. upon dead children. The mortality rate of perforation following the operation itself, was 2.5 per cent.; the morbidity of the mother was 3 per cent.

In these cases, the operation was practised upon the living child. Where the child was dead the maternal mortality varied from 6.7 to 5.4 per cent.; the maternal morbidity was 17.5 per cent.

In Doederlein's clinic in Munich, from which these results are taken, Cesarean section was performed in 0.16 of 1 per cent. of cases. In contracted pelvis, the relative indication was a diagonal conjugate ranging from 8.5 to 10 cm. The absolute indication was a diagonal conjugate measuring from 5.5 to 6 cm.

The results for the fetus were superior to those of other operations. The results of the mother compared favorably with other operations. In vaginal Cesarean section there was no maternal mortality, while the fetal mortality was practically that of complicated labor with other operations.

Twenty-five cases of pubiotomy are reported with good results.

In general, it may be stated that the use of the forceps is much less common than formerly in obstetric clinics. Version and perforation of the living child are less frequently performed than formerly. Cesarean section is practised much more commonly in its various forms. In combination with pubiotomy or vaginal Cesarean section, the high forceps operation is more often done. Obstetric operations are chosen with more care and intelligence, and the total number of operations is probably less than in former years.

Symphysiotomy and Pubiotomy. Prentiss¹ reports the case of a patient in her second pregnancy whose first child was dead born after difficult forceps delivery. The pelvis was symmetrical but moderately contracted. The patient was allowed to go to viability by calculation, being eight months pregnant. Under ether, rapid dilatation was practised and an attempt made to extract by forceps, which failed. The pubic joint was opened through a long wound passing to the side of the clitoris and well above the bone. The bone separated 6 or 8 cm., and delivery was readily accomplished in about twenty minutes. There was no injury to the bladder, urethra, and vagina, and the bones were wired together without difficulty.

The patient had no fever, but died suddenly on the third day after being delivered. Upon autopsy the uterine veins were thrombosed, as were the veins of the left broad ligament, and the left ovarian and right heart. Death resulted from cardiac thrombosis and acute dilatation of the ventricle. There was no evidence of sepsis.

On the day preceding death the patient complained of slight pain in the right leg and general malaise. The child survived.

The question is raised whether delivery by abdominal section would have been less apt to produce thrombosis.

Pubiotomy Followed by Insufficiency of the Bladder without Fistula, and its Operative Treatment. Kroemer² reports 64 pubiotomies, 58 in hospital and 6 in private houses.

These operations were performed by Bumm's method, introducing a sharp needle beneath the left portion of the symphysis through the greater labium or into the interlabial sulcus. The needle was passed through beneath, laterally, above and toward the median line, the point of the needle being kept close against the bone to avoid injury to the soft parts.

During the operation the condition of the urine is noted to see whether it remains clear or becomes bloody. Bloody urine is thought to indicate injury to the bladder. After the passage of the needle the pubis is severed with a saw, and spontaneous labor is allowed to occur, if possible.

Pubiotomy was not chosen for the true conjugate less than 7.5 cm.

¹ American Journal of Obstetrics, May, 1909.

² Zeitschrift f. Geburtshilfe und Gynäkologie, 1909, Band lxxv, Heft 2.

In cases where it was probable that the operation would be accompanied by extensive injury to the birth canal, it was not selected.

In 64 cases the bladder was directly injured by the needle in 3, and bloody urine was present as an indication of the injury. These 3 cases recovered without other treatment than permanent drainage by the catheter.

In 10 cases during convalescence, complications occurred, indicating that the bladder or its surrounding tissues had been injured. In one the urine escaped through the perforation by the needle, a hematoma forming at the site of the application of the saw. This fistula closed spontaneously.

In a second case, in spite of episiotomy, a vulvovaginal laceration occurred from the left side, reaching to the neck of the bladder, through which a fistula developed. It was afterward closed by a plastic operation.

In the third case labor was terminated by the forceps because the child became asphyxiated. A vulvovaginal laceration on the left side occurred, which included the bladder and urethra. Operation was unsuccessful, and a secondary operation for the reconstruction of the sphincter of the bladder finally cured the patient.

In the fourth case the patient had symptoms of eclampsia, and an effort was made to dilate the cervix with Bossi's dilator after pubiotomy. An effort to deliver by forceps failed, and perforation and extraction were performed. The vagina and urethra were torn. An effort was made to repair the injury, but the wound became infiltrated with urine, and an abscess resulted. The tissues were freely opened for drainage, and healing finally took place with the destruction of the urethra and sphincter of the bladder. A further effort was made to repair the injuries by operation, but this succeeded only sufficiently for the patient to retain the urine while in the recumbent posture.

The fifth case was terminated by the use of forceps after pubiotomy with a laceration opening the bladder. Septic infection occurred at the site of the laceration, the patient perishing from septic pneumonia with embolism.

In the sixth case of forceps delivery after pubiotomy, a cervical vesical fistula developed, which healed spontaneously.

In case seven, pubiotomy and the use of forceps were employed for threatened eclampsia. A laceration occurred opening the neck of the bladder, which was immediately repaired, but the patient suffered from incontinence. A plastic operation was performed upon the sphincter which relieved the patient.

In the eighth case, forceps delivery was practised after pubiotomy, accompanied by a vesical vaginal laceration, which was immediately closed but did not heal. A secondary plastic operation was successful.

In the ninth case, pubiotomy and forceps were followed by a laceration in the neck of the bladder, which healed by primary union, leaving incontinence. An operation upon the sphincter was performed when

the patient's condition improved. She again became pregnant, and could retain the urine while in the recumbent posture and for some time while upright.

In the tenth case, bloody urine was observed after the operation. Urine escaped from the upper needle puncture. Examination with the cystoscope showed in the line of incision by the saw an opening into the bladder admitting the tip of a uterine sound. The use of a permanent catheter was followed by recovery in three weeks' time.

Vesical fistulæ developing after pubiotomy may be divided into three kinds:

In one the instrument introduced to carry the saw may draw the wall of the bladder into the tract of the saw and produce a wound of the bladder. The fistula becomes evident when the bones separate during delivery.

In some cases the bladder wall prolapses into the track of the saw and is injured and lacerated by the saw. These fistulæ develop in the anterior bladder wall behind the symphysis. A more frequent form of injury to the bladder occurs in the inferior portion of the neck of the bladder at the site of the pubovesical ligament. The separation of the bones puts this ligament upon the stretch, and if the bladder is impaired in elasticity, laceration results. These injuries usually occur during forceps extraction when the bone separates suddenly after pubiotomy.

The examination of the blood with the cystoscope with the patient in the knee-chest posture and the bladder distended with air, enables the operator to locate these injuries. In some cases the urethra is found shortened and contracted by scar tissue. The introduction of the catheter shows that the sphincter of the bladder has been injured. The urethroscope passes at once into the bladder. Upon withdrawing the tube of the endoscope it is seen that the muscular tissue has been replaced by elastic tissue, the mucous membrane of the bladder prolapsing into the urethra.

An effort was made to repair these injuries by an incision between the clitoris and urethra along the inferior border of the pubis extending to the bony tissue. The urethral opening was loosened from the scar tissue and the incision deepened until the connective tissue behind the symphysis was loosened from the joint. The anterior bladder wall was freed and made freely movable. The remains of the pubovesical ligament were then identified as strands of connective tissue. The tissues were then brought together laterally to build a new neck of the bladder, the urethra was separated from the symphysis, and its walls brought together by sutures. Hemorrhage was controlled by the stitches applied from side to side. The external orifice of the urethra was fixed by sutures as nearly as possible in its normal location, and the original crescent-formed incision was brought together. The vagina was tamponed to check oozing, and the bladder was permanently drained by a catheter

for eight days. The presence of the catheter prevented the sphincter of the bladder from closing too tightly. The catheter was retained until it seemed that the normal dimensions of the neck of the bladder had been secured.

The operation is not an easy one, as it is difficult to recognize the tissues in the abundant scar material, and the scar tissue is inelastic and difficult to manipulate. Stitches often cut through the bladder wall in the attempt to make the new neck of the bladder. After the wound had healed the capacity of the bladder was cautiously increased by distending it with sterile fluid. In one case it was thought that some benefit resulted from massage and the use of electricity for the sphincter of the bladder, placing the negative pole in the urethra. Two of the patients regained good control of the bladder.

In some of these cases it seemed that pubiotomy was not accountable for the injury to the bladder, but that the use of Bossi's dilator, or other means for rapid dilatation, with the high application of the forceps, had caused the injury.

These cases abundantly illustrate the danger of delivery through a partly dilated cervix.

To avoid these complications the cases for pubiotomy and vaginal delivery must be carefully selected. The operation should not be chosen for a true conjugate of less than 7.5 cm., nor is the operation indicated in cases where the birth canal is greatly contracted. If possible, spontaneous labor should be procured after pubiotomy. In some cases of spontaneous labor with strong pains, the operator may observe extensive lacerations which develop suddenly in spite of his effort to prevent them.

In performing pubiotomy it seems important to separate the pre-vesical tissues from the pubis. In this way laceration is prevented when the bones separate. When it is evident that lacerations cannot be prevented it would seem best to separate the tissues from the pubis and to endeavor to bring together the parts to secure primary union. The tissues are then in better condition than after they have contracted and formed scar tissue during the puerperal period.

In discussing this paper, Bumm believed that incontinence developing after pubiotomy results less from injury to the sphincter of the bladder than from the contraction of scar tissue. He believed that, in the operations described, the freeing of the neck of the bladder from scar tissue and from the inferior border of the pubis brought about the cure. If the neck of the bladder be freed from scar tissue, its sphincter partly reforms; but if scar tissue binds the neck of the bladder to the pubis, its function is hindered and its anterior portion becomes useless. In one case he attempted twice, and Stoeckel once, to form a sphincter for the bladder by opening through the vagina, without success. When the neck of the bladder was freed from scar tissue a good result followed. He believes that the needle is the least important factor in producing

these lacerations. Most of them result from the passage of the fetal head. In multipara these injuries rarely occur. In cases where the birth canal is undilatable and undeveloped, the passage of the head is generally accomplished by great distention of the tissues and inevitable lacerations.

In closing the discussion, Kroemer reported 9 patients who had spontaneous labor in pregnancies following delivery by pubiotomy. In these cases the pelvis separated spontaneously at the time of labor, but regained its usual proportions without difficulty. This arose from the fact that the pelvic girdle was not severed in the centre, but at the sides, which left the subpubic ligament practically uninjured. This constitutes an essential merit in Bumm's method of pubiotomy.

Cesarean Section. VAGINAL CESAREAN SECTION. Sprigg¹ reports 4 cases of vaginal Cesarean section at the Columbia Hospital in Washington. These were performed for eclamptic convulsions and resulted successfully so far as delivery of the mother was concerned. The method pursued was practically that advocated and described by Fry, in which the patient is prepared for vaginal hysterectomy and placed in the lithotomy position. The perineum was depressed with a broad retractor and the cervix grasped on each side in the median line. To save the space occupied by the forceps, two heavy silk traction sutures may be applied instead. A sound is passed into the bladder to locate its lowest attachment to the uterus. The cervix is drawn downward and backward and the mucous membrane just below the junction of the cervix and vagina is incised laterally. The bladder is dissected by blunt dissection, with the finger covered with gauze to a point four inches from the anterior uterine wall. If necessary, a longitudinal incision in the anterior uterine wall may be made. The bladder wall is now held up and out of the way by a long-bladed vaginal retractor. The cervix is then split, with strong unpointed scissors, longitudinally in the median line sufficiently far above the internal os to give room for version and the application of forceps. If possible, the membranes should not be ruptured by this incision. The incised cervix and lower uterine segment are then cautiously dilated, when the fetal membranes prolapse and may be ruptured. The fetus, placenta, and membranes are then removed and the uterus irrigated with hot salt solution, and packed with iodoform or sterile gauze. The bladder wall is then held out of the way by a retractor, and the perineal retractor again inserted, and the uterine wall closed by the transverse vaginal incision. The transverse incision and the cervix are then closed by interrupted sutures, care being taken to leave the cervical canal sufficiently open to allow free drainage. The vagina is loosely packed with sterile or iodoform gauze.

CESAREAN SECTION FOR PLACENTA PRÆVIA. This topic has excited much interest among obstetricians, and in order to judge of the value

¹ American Journal of Obstetrics, October, 1909,

of the operation, its results must be compared with the obstetrical treatment, so called, of placenta prævia, which consists in the use of elastic bags or version by the method of Braxton-Hicks.

Hannes¹ in these cases considers children viable having a length of 46 to 47 cm., and weighing over 2000 grams, this being at the thirty-fifth or thirty-sixth week of gestation. In these statistics the children that did not survive but two or three days after birth were considered as stillborn. The statistics embrace 246 cases, in 143 of which, or 60 per cent., the elastic bag was employed. The results of the use of this bag are to control the hemorrhage and to secure sufficient dilatation to permit version or delivery. In general, the mortality rate of children was reduced to 30 per cent., which is a great improvement upon the fetal mortality by the use of the gauze tampon, version, and extraction.

In the whole series of cases treated by obstetric methods of delivery, the maternal mortality was 6.6 per cent. Among the cases treated by the use of the elastic bag, the maternal mortality was 5.5 per cent. The mortality from infection in these cases of placenta prævia was 0.18 per cent.

By all methods of treatment, except section, from 60 to 70 per cent. of the children were born living. These results indicate a very great improvement in the treatment of placenta prævia by vaginal delivery without section.

The American Gynecological Society, May, 1909, discussed this subject. Jewett reviewed the literature, collecting 2010 cases of placenta prævia, with the birth of 2020 children, in which vaginal delivery was effected without resort to section.

The maternal mortality was 10.9 per cent.; the fetal mortality was 57.3 per cent. He also collected 95 cases of section with the birth of 97 children, in which the maternal mortality was 11.5 per cent.; the fetal mortality was 34 per cent.

Fry reviewed the literature of the subject, coming to the conclusion that in about 5 per cent. of all cases of placenta prævia conditions favorable for section would be present.

Newell believed that the skilled surgeon would have better results in central placenta prævia with mother and child in good condition, by resorting to section than by choosing other methods of delivery.

Spencer agreed that in a certain proportion of cases of placenta prævia, abdominal Cesarean section should be considered.

Hofmeier thought that this was true in a small number of cases, and in this opinion Green coincided.

Novak² reviews this question, and collects statistics of the results of vaginal delivery without section in placenta prævia.

In 237 cases the maternal mortality was 5.9 per cent.; the fetal mor-

¹ Zentralblatt f. Gynäkologie, 1909, No. 3.

² Monatsschrift f. Geburtshilfe und Gynäkologie, 1909, Band xxx, Heft 4.

tality was 74 per cent., and as some of these children perished soon after birth the fetal mortality was increased 79 per cent.

The mortality of placenta prævia a few years previously in cases occurring in general practice was estimated by Fùth as 19.7 per cent. for the mothers. In private practice the cases treated by general practitioners were undoubtedly those less dangerous than cases sent to hospitals. In 105 private cases the maternal mortality was estimated at 3 per cent.; the fetal mortality at 38.7 per cent.

The question arises: Can these results be improved by Cesarean section? If the statistics of Cesarean section for placenta prævia in operations performed from ten to twelve years ago be estimated, the results of Cesarean section are no better than those obtained without section. When the statistics of section for the last few years are studied, it is found that the maternal mortality is reduced to between 3 and 4 per cent.—the best results obtained in selected cases by vaginal delivery. The fetal mortality has been materially lessened by section.

Novak's conclusions are conservative, and he believes that section is indicated in cases where abnormalities in the uterus exist, which make dilatation in the cervix especially dangerous, and in cases where special value is placed upon the life of the fetus. In many cases the woman is already infected by the use of the tampon and is in a highly anemic condition from hemorrhage, making the conditions unfavorable for section.

Classic section by the abdominal method is to be chosen if section is to be performed.

The reviewer's experience causes him to believe that in uninfected cases of central placenta prævia not exhausted by hemorrhage, mother and child being in good condition, abdominal Cesarean section is indicated as soon as the diagnosis of the condition is made.

In 71 sections he has met 2 cases in which these conditions were present. In each, the child was delivered promptly by abdominal section, mothers and children making uninterrupted recoveries. The placenta was directly over the internal os, there was slight dilatation present, and after the removal of the uterine contents the cervix was dilated from above by the fingers sufficiently to permit drainage. The uterus was packed with 10 per cent. iodoform gauze, special attention being given to firmly tamponing the lower uterine segment and cervix. The end of the gauze was carried into the vagina. The uterus was closed in the usual manner and the vagina tamponed with gauze. Hemorrhage ceased as soon as the uterus was opened, and postpartum hemorrhage did not occur.

The reviewer believes, however, that Cesarean section should not be resorted to in placenta prævia in cases where repeated examinations have been made by unskilled persons, and where mother and child have been weakened by hemorrhage or infection.

In these cases it was interesting to observe the prompt cessation of hemorrhage and its efficient control by the method described.

CESAREAN SECTION IN AN AGED PRIMIPARA. Grimsdale¹ performed abdominal Cesarean section upon a primipara aged forty-four years.

The patient was a strong, healthy woman, with a normal pelvis. The birth canal was exceedingly rigid, and to save the life of the child and avoid mortality and morbidity for the mother, section was performed.

Mother and child recovered without incident.

CESAREAN SECTION IN CONTRACTED PELVIS. Schauta² tabulates the results of treatment in his clinic in 5288 cases of contracted pelvis occurring among 49,397 women; 77.8 per cent. of these patients had spontaneous birth, with a maternal mortality of 0.09 of 1 per cent.; a fetal mortality of 2.2 per cent. The forceps was used in 3.9 per cent. of cases, with no maternal mortality, and 11.6 per cent. mortality for the children. Version was performed in 6.6 per cent. of cases with a maternal mortality of 0.5 of 1 per cent. and a fetal mortality of 28.6 per cent. Extraction by the breech was performed in 0.5 per cent. of the cases, with a maternal mortality of 3.3 per cent. and a fetal mortality of 40 per cent. Craniotomy on the dead child was done in 1.5 per cent. of the cases, with a maternal mortality of 6 per cent. Decapitation in 0.16 per cent., with a maternal mortality of 33.3 per cent.

In so-called prophylactic operations, premature labor was performed in 0.6 of 1 per cent. of cases, with a maternal mortality of 2.9 per cent., and a fetal mortality of 47 per cent. Prophylactic version was performed in 1.7 per cent. of the cases, with a maternal mortality of 1.05 per cent., and a fetal mortality of 21 per cent. The forceps was applied above the pelvic brim in 2.7 per cent. of cases, with a maternal mortality of 1.3 per cent. and a fetal mortality of 38.7 per cent. Craniotomy on the living child was done in 1.4 per cent. of the cases, with the same maternal mortality which followed the application of forceps above the pelvic brim, namely, 1.3 per cent.

Cesarean section for the relative indications was performed in 2.1 per cent. of cases, with a maternal mortality of 3.4 per cent. and a fetal mortality of 1.7 per cent. The pelvic girdle was opened in 2 per cent. of cases, with no maternal mortality, and 4.3 per cent. mortality for the children.

By comparison, it will be seen that Cesarean section has the lowest fetal mortality of any method of birth in contracted pelvis, not excepting spontaneous birth. Its maternal mortality compares favorably with induced labor and extraction by the breech.

THE DIFFICULTY OF REPEATED CESAREAN SECTION. Brindeau³ draws attention to the fact that hernia of the abdominal wall, adherence of abdominal tissues to the uterus and scar, softening of the uterine

¹ Journal of Obstetrics and Gynecology of the British Empire, May, 1909.

² Ibid.

³ L'Obstetrique, January, 1909.

wall in the line of incision, and adherence of the placenta to the scar of a former operation, may all complicate repeated Cesarean section.

He reports 6 cases illustrating these complications, one of whom perished from congestion of the lungs after operation. This patient had a mitral lesion, and the first section was done because her condition was so threatening that section was thought to be the most favorable operation. In the second section, there were numerous adhesions between the uterine and abdominal wall which required considerable time and manipulation. The patient's heart action and respirations failed after the operation.

Olshausen¹ discusses the question of the improvement of the results to be obtained by Cesarean section. He calls attention to the brilliant results obtained in the classical section, and in suprasymphyseal section by experienced operators. He believes that improvement in the results of these operations lies not so much in matters of technique as in limitation of operative procedures in uninfected patients in good condition.

Our efforts should be directed to securing complicated cases at the very beginning of labor, and preventing infection and injury by previous injudicious manipulation.

THE VALUE OF CLASSICAL CESAREAN SECTION IN COMPARISON WITH OTHER OPERATIONS. Schauta² reviews the history of Cesarean section with special reference to modern methods recently introduced.

From the results of his observations in clinic, he concludes that in all cases in which spontaneous labor cannot reasonably be expected when the patient has within the womb a living child in good condition, some operative procedure must be chosen. In the lesser grades of contracted pelvis in primipara, the classical Cesarean section should be selected. In multiparæ this operation also gives good results, but many cases result favorably with *hebstiotomy*. In complicated cases of primiparæ where manipulation has been practised, extraperitoneal section should be done, and drainage of the uterus employed. When these conditions are present in multiparæ, *hebstiotomy* is indicated. In infected cases of moderate pelvic contraction, craniotomy should be selected unless the child is in exceptionally good condition.

If an effort is to be made to save the life of the child, it may be delivered by section followed by drainage of the uterus through an abdominal fistula.

In cases of pronounced disproportion between mother and child, where infection is absent, the classic Cesarean section should be selected. If these cases are complicated by previous attempts at delivery, extraperitoneal section with drainage should be selected. When the operator finds these patients already infected, the Porro operation may be performed, or total extirpation of the uterus practised, or the patient

¹ Zentralblatt f. Gynäkologie, 1909, No. 43.

² Monatsschrift f. Geburtshilfe und Gynäkologie, 1910, Band xxxi, Heft 1.

delivered by section and the uterus drained through an abdominal fistula.

Suprasymphyseal Cesarean Section. INDICATIONS FOR SUPRASYPHYSEAL SECTION AND TOTAL EXTIRPATION. Von Franqué¹ reports a case of successful suprasymphyseal section, and also a case of total extirpation of the uterus performed for infection and threatened rupture.

Upon examining this uterus after its removal, a pronounced contraction ring could be observed, 5 or 6 cm. above the internal os. In both cases, mother and child recovered.

He also reports a case of transverse presentation with premature rupture of the membranes in a patient having contracted pelvis. The elastic bag was inserted to secure dilatation, and labor was finally terminated by opening the pelvic girdle, or by difficult version and extraction. The mother died of embolism. Upon examining the tissues, it was found that the elastic bag exercised sufficient pressure to produce a vesicovaginal fistula.

This case is compared with the other two to illustrate the greater safety of delivery by section in complicated labors.

THE IMPORTANCE OF DISTENDING THE URINARY BLADDER IN PERFORMING SUPRASYPHYSEAL SECTION. Latzko² reiterates his advice that in performing suprasymphyseal section the urinary bladder be moderately distended. He describes in detail a case in which a wound in the bladder followed the delivery of a child after suprasymphyseal section. In this case the bladder could not be brought up sufficiently until distended, and then the attachments of the bladder were found to be so contracted that it was necessary to ligate and divide the left lateral ligament of the bladder. The delivery of the child was difficult, but was successfully performed. After delivery a transverse wound of the bladder above the trigonum was found upon the left side. This was immediately closed and the tissues drained, both mother and child making a good recovery.

Freund³ reports two successful suprasymphyseal sections in which he omitted Latzko's precaution of distending the urinary bladder. The first of his cases was delivered by forceps after the suprasymphyseal section had been made. There was no laceration of the tissues, and the parts were brought together without drainage.

In the second case it was necessary to bring the head of the child through the cervical opening by pressure from above through the abdominal wall, and also by pressure through the vagina. There was some post-partum hemorrhage after delivery, which promptly ceased with the injection of ergot. The tissues were closed without drainage, the patient making a good recovery.

¹ Monatsschrift f. Geburtshülfe und Gynäkologie, 1909, Band xxix, Heft 1.

² Zentralblatt f. Gynäkologie, 1909, No. 22.

³ Ibid., No. 16.

THE HISTORY OF EXTRAPERITONAL SECTION. Nürinberger¹ finds that in the ten years preceding 1880, 8 gastroclytrotomies had been performed, 6 of these in America and 2 in England. The maternal mortality was 50 per cent.

In Clark and Duncan's series of 14 cases, the same maternal mortality prevailed, with a fetal mortality of 42.8 per cent.

It is estimated that in 66 per cent. of these cases the bladder or ureter was wounded. This operation gave place to the Porro operation, which was in turn supplanted by Säger's celiohysterotomy.

Runge² tabulates 22 cases of suprasymphyseal section in Bumm's clinic. He described as especially instructive two fatal cases, one in which convalescence was greatly complicated. The first fatal case was that of eclampsia. The patient was a primipara, aged thirty-four years, with excessive edema of the external genitals, which made a vaginal operation practically impossible. Upon making section, the preperitoneal fat was so abundant as to render the operation difficult. It was necessary to open the peritoneum to gain a clear view of the tissues. The child was delivered by version and extraction, and as hemorrhage followed, the placenta was removed by the hand and the uterus tamponed. The wounds were immediately closed without drainage. The patient collapsed after the operation and was revived with difficulty. She afterward became excessively restless, with normal temperature, and it was feared that suppuration was occurring deeply in the tissues. The wounds were reopened, when clotted blood and foul secretion escaped. The patient collapsed and died.

Autopsy showed extensive necrosis in the wounds with beginning abscess. The greater portion of the peritoneum was uninfected. There was greenish fluid in the abdominal cavity; there was profuse extravasation of blood beneath the mucous membrane of the bladder, especially in its inferior portion. Delivery showed the characteristic lesions of eclampsia. The spleen was enlarged and the uterine wall contained a fibroid tumor. The patient died from purulent necrosis in the operation wounds, abdominal tissues, and uterus.

In the second case, the operation was performed without special difficulty and without wounding the peritoneum. The amniotic liquid contained meconium, and microscopic examination showed the presence of bacteria. The fluid was discolored and had an offensive odor. The child was delivered by forceps and the placenta expressed. As the peritoneum had not been wounded, the uterus and abdominal wall were closed without drainage.

The patient had symptoms of infection after operation, and the lower angle of the wound was opened, emptying gas and stinking pus. The patient died with symptoms of infection. The cervical secretion contained abundant streptococci and staphylococci.

¹ Zentralblatt f. Gynäkologie, 1909, No. 26.

² Archiv f. Gynäkologie, 1909, Band lxxxix, Heft 2.

At autopsy the clinical diagnosis of septic infection was confirmed.

In the third case, the patient was rachitic with highly contracted pelvis. The membranes had ruptured some time before delivery. The child was delivered by forceps, and in the amniotic liquid bacteria were found. The uterine wound was closed, but in view of the infected condition of the amniotic liquid the pelvic tissues were drained by gauze, and a catheter was placed in the bladder. The patient developed symptoms of infection, with distended abdomen, the wounds were reopened and necrosis found in the borders.

The wound secretions contained few streptococci, but abundant staphylococci, which were also found in the amniotic liquid. The wounds were kept opened by a gauze tampon, and although considerable necrosis developed the patient ultimately recovered.

In the after treatment of these cases, drainage was employed in 2; 19 had uncomplicated puerperal periods; in 6 there was abscess in the abdominal wall; in 3 cases the puerperal period was seriously complicated. The maternal mortality of this series of cases was 9.1 per cent.; the fetal mortality was nil.

In 15 of the 22 mothers, the uterus was in normal position and condition when the mothers were discharged. So far as could be ascertained no complications developed after the patients left the hospital.

Fraipont¹ reports 8 cases of suprasymphyseal section. The mothers recovered, and one child was lost from meningitis following injury to the cranium. In delivering the child, the obstetric forceps was used, and the usual difficulties and complications described by others were experienced.

Jeanin² has collected 148 cases of suprasymphyseal section. The maternal death rate was 7.45 per cent. Death from infection occurred in 3.4 per cent. If these statistics are combined with Latzko's collection of 150 cases, the maternal mortality is reduced to 7.37 per cent. If cases of eclampsia are excluded, the mortality rate from infection for the mothers is between 4 and 5 per cent.; if morbidity be considered, infection occurs in one-fourth of the cases. The fetal mortality was 8.18 per cent.

In comparing the extraperitoneal and transperitoneal methods, the former had a mortality from infection of 3.08 per cent.; the latter an infected mortality of 3.8 per cent.

A FATAL CASE OF SUPRASYPHISEAL SECTION. Von Rosthorn³ reports a fatal case of extraperitoneal section performed upon a patient whose first labor was terminated by the classical section.

The wound was drained above the symphysis with iodoform gauze. Infection developed from which the patient died, and autopsy showed streptomyces originating in a hematoma which suppurated, and from

¹ L'Obstetrique, July, 1909.

² Ibid., August, 1909

³ Zentralblatt f. Gynäkologie, 1909, No. 29.

multiple abscesses in the connective tissue. It was impossible to locate the original focus, but it is interesting to observe that an abscess of considerable size had developed in a suppurating appendix.

Suprasymphyseal sections are reported by Küstner,¹ his first case being an infected patient who had a tumor originating in the periosteum, which made vaginal delivery impossible. The patient recovered with uterine drainage.

The second case was also successful, although during the operation a branch of the uterine artery was wounded and required ligation.

Fuchs² reports a successful suprasymphyseal section with drainage of the prevesical space with gauze.

Franz³ reports two cases, in the first of which an abscess formed in the left side of the pelvis which ruptured spontaneously, showing a pure culture of the *Bacillus coli communis*. The second case was complicated by a vesicovaginal fistula which closed spontaneously.

As both cases were infected at the time of operation, Franz questions whether a Porro operation would not have been better.

Veit⁴ reports a fatal case of Cesarean section in which the *Bacillus coli communis* infected the peritoneum. This arose undoubtedly from the amniotic liquid which gained access to the abdominal cavity during the delivery of the child by version. Examination of the amniotic liquid showed the presence of this germ.

Reifferscheid⁵ reports 19 suprasymphyseal sections. These he divides into two groups: The first 3 cases in which the peritoneum was opened and the visceral and parietal edges brought carefully together. The uterus was then opened by longitudinal incision. The wound was drained with iodoform gauze. One of these patients died from infection. In the remaining cases the operation was performed without opening the peritoneum, the patients making good recoveries.

Reifferscheid believes that in clean cases the abdomen should be opened by transverse incision, and access gained to the lower uterine segment without opening the peritoneum. In cases where infection is suspected, a longitudinal incision should be made and the uterus drained. This can often be accomplished by passing a gauze drain from the uterine cavity through the cervix into the vagina, and closing the uterus from above. In cases where severe infection is evidently present, craniotomy should be performed, if possible, even upon the living child.

Successful suprasymphyseal operations are reported by Jahreiss, Nacke, Heinricius, Eversmann, Frank, and Rubeska.⁶

Stolz⁷ reports a case of contracted pelvis in which labor was allowed to go on until the patient showed signs of exhaustion and infection, and the child's heart sounds began to fail. The child was then delivered

¹ Zentralblatt f. Gynäkologie, 1909, No. 36.

³ Ibid., No. 24.

⁴ Ibid., No. 32.

⁶ Ibid., No. 33.

² Ibid., No. 21.

⁵ Ibid., No. 33.

⁷ Ibid., No. 41.

by section and the uterus removed. Mother and child made a good recovery.

Solms¹ reports 6 cases of what he terms Cesarean section through the flank. An incision was made at the side of the abdomen toward which the vertex of the child was directed. The uterine and vaginal tissue was opened and the child easily extracted with forceps. The placenta was expressed by Crede's method. The wounds in the uterus and vagina were closed, and also the abdominal wound.

In the second operation, it was necessary to ligate the round ligament and to divide it. The bladder was pushed up and the thinnest portion of the lower uterine segment chosen for the incision. The child was delivered by forceps. Drainage was employed in the space anterior to the cervix.

In the third case the operation was complicated by profuse hemorrhage which ceased when the uterus was emptied. In spite of drainage, suppuration occurred in the connective tissue, which gradually ceased in two weeks following the operation. The patient immediately made a good recovery.

In the fourth case, difficulty was found in separating the bladder, as its attachments seemed to extend low in the pelvis. The incision was made upon the right side, as the bladder was directed more to the left. The pelvis of the patient was raised during the operation, to give the operator access to the tissues deep in the pelvis. The child was delivered in face presentation. In this case, it was necessary to divide the round ligament. The wounds were closed without drainage, the patient making a good recovery.

A fifth case is reported which also proved successful.

In the sixth case, the cervix was dilated partially at the time of operation, the bladder was separated by bimanual manipulation, and the cervix opened through a transverse wound in the vagina. It was necessary to separate the peritoneum and the round ligament. The child was easily delivered by version, and drainage was employed in the space behind the bladder. The patient made a good recovery.

In some of these operations care was taken to distend the bladder and push the bladder wall and cervix upward by introducing an elastic bag into the vagina. The purpose of the operation is to avoid opening the peritoneum. The method employed resembles much that of Ritgen.

Matthaei² reports a successful suprasymphyseal section by Sellheim's method.

Rühle³ reports 2 cases of suprasymphyseal sections. Both operations were successful.

In the extraperitoneal method, Latzko's modification of the Sellheim

¹ Zentralblatt f. Gynäkologie, 1909, No. 51.

² Monatsschrift f. Geburtshülfe und Gynäkologie, 1909, Band xxx, Heft 5.

³ Ibid., Heft 6.

method is chosen. In the intraperitoneal operation in clean cases, it is recommended to open the abdomen by the transverse incision, and to also use this incision in opening the parietal peritoneum of the cervix uteri. It is thought best not to deliver the child with forceps, but to press the head upward out of the uterus by pressure exerted through the vagina. The operator, if he uses rubber gloves, can change them after manipulating in the vagina without danger of infecting the peritoneum.

THE NEWBORN.

Convulsions of the Newborn. Esch¹ reviews the statistics of the frequency of convulsions in the newborn, finding that various authors described them as occurring in from 2.69 per cent. of all cases to 0.13 per cent. of cases. The mortality varies from 100 per cent. to 25 per cent. In 13 cases, Durante found umbilical infection in 5; oedema in 3; asphyxia in 3; syphilis in 1; and hereditary eclampsia in 1.

The most usual variety of convulsions is the *tonic*, occurring both intermittently and as persistent spasm in the extremities and muscles of the neck. It is found by observation and experiment in the newborn that in spasm the muscular tissue remains in a tonic condition between periods of irritation of the motor nerves. It is styled by Hochsinger, *mytonia neonatorum*. Both tonic and clonic convulsions often result from a localized lesion of the central nervous system. The idiopathic tonic spasm seen in older children is not observed in the newborn. Many of these result from organic lesions in the brain and cord. Traumatic injury to the brain is also a cause.

While it has been shown by experiment that direct irritation of the cortical centres in the newborn may not produce tonic spasm, pressure upon the brain occurring during labor may also alter the pressure of the cerebral contents so as to produce spasm.

Seitz had the opportunity of observing a hemicephalic child born living, in which pressure upon the motor cortical centres produced spasm in the legs and movements of the arms.

Westphal in a young nursing child with congenital defects in the cranial wall which left the brain covered only by the pia found the motor cortex did not respond to irritation.

Weber observed facial paralysis from intermeningeal hemorrhage in the newborn which persisted for some time, finally disappearing.

Seitz also observed unilateral tonic spasm and paresis from subdural bleeding. In a case delivered by forceps, Henoch saw left-sided clonic spasm, which could be explained by pressure upon the right coronal suture. Extravasation of blood in this region was the cause of spasm.

Zappert, upon microscopic study, found degeneration in the anterior roots of the cord in some cases of spasm.

¹ Archiv f. Gynäkologie, 1909, Band lxxxviii, Heft 1.

Thiemich observed the same process in the posterior roots in the medulla oblongata, the cerebellum and cerebrum.

Spasms in the newborn may be divided into functional and organic. Many disturbances in the infant, such as fever and dyspnoea, may produce functional spasm. Organic spasm is often seen in rachitic children and in cases of deficient development in the nervous centres in the peripheral nerves.

Many *functional spasms* in the newborn result indirectly from the constitutional diathesis. This condition is most evident from the second to the third month. In the newborn, functional spasm results from the physiological condition of the newborn, which is predisposing. The brain is not sufficiently developed to inhibit reflex irritation as is seen in frequent disturbances of respiration and heart action. Parental alcoholism, syphilis, and blood poisoning predispose to this condition. The anterior fontanelle is greatly distended during the spasm, and upon autopsy capillary hemorrhage into the brain is present. Disturbances in the circulation increasing the tension of the cranial contents is a frequent cause.

The theory of cerebral reflexes must also receive attention in explaining spasm in the newborn.

Conditions of toxemia and infection may also be present in these cases. These act upon the nervous system through the blood. Bacteria or toxins from the intestine, liver, and kidneys, acetone, ammonia, and carminic acid are causes for this condition. The accumulation of carbonic acid gas producing intoxication must also be remembered.

In *diagnosing this condition* care must be taken to examine the child thoroughly in the intervals between the spasms. The history of the labor is also of value, and it must be remembered that many cases of cerebral hemorrhage accompany spontaneous birth, especially in cases where the bones of the cranium are not well ossified. When the spasms are unilateral and persistent, they are probably of organic origin. This is the case when between spasms the child shows sopor, variation in pulse, or opisthotonos. Spasm of the lower extremities may also develop from purely functional causes. Lumbar puncture and examination of the cerebrospinal fluid may give evidence of organic disease. When the anterior fontanelle is greatly distended, or when through pressure upon the fontanelle the spasm can be reproduced, disease of the brain is evidently present. It must be remembered that if the general blood pressure of the child is very low and the action of the heart weak, that the tension of the fontanelle also sinks; while after repeated spasm, if edema develops, the tension of the fontanelle may again become increased. Porencephalus causing hemorrhage, and cephalitis and softening of cerebral tissues, usually produces spastic hemiplegia or diplegia. Hydrocephalus produces nystagmus with paresis and spasm in various groups of muscles in addition to general convulsions,

It must be remembered that hydrocephalus may produce great disturbance in the cerebral circulation before labor. In microcephalus, rigidity of the muscles often develops. The arms are bent at the elbows, the hands flexed, and the legs extended and strongly adducted. Hypertrophy of the brain often connected with enlargement of the cranium may also produce pressure symptoms and convulsions. Syphilis in the newborn rarely causes clinical phenomena in the brain, with the exception of hydrocephalus. Acute and persistent distention of the ventricles is often of syphilitic origin. The diagnosis is more sure when increased tension and lymphocytosis are found in the cerebrospinal fluid. Different varieties of meningitis and encephalitis are also cited as causes of spasm. In cachectic children the phenomena of thrombosis and phlebitis are observed. This produces sopor or tonic spasm. Intracranial hemorrhage is often subarachnoidal and subdural. The latter may be in the tentorium above the cerebrum. The hemorrhage may also be beneath the tentorium, but above the cerebellum and medulla. The cases explain the symptoms seen after hemorrhage into the ventricles has occurred. Severe intermeningeal bleeding usually produces symptoms of profound asphyxia, and not of cerebral irritation, the child usually dying comatose.

In slight hemorrhage, infants may retain considerable vigor, or may be born slightly asphyxiated, the cerebral symptoms developing during the first or second day following. In supratentorial bleeding there is great restlessness, frequent cry, early increase in the tension of the anterior fontanelle, with diminished pressure over that portion of the lambdoid suture where the bleeding occurs. The skin is unusually white and pale. Facial paralysis with drawing of the tongue to the paralyzed side is also present. Spasm and paralysis of the arms and legs and increased reflexes on the affected side, may be observed. Oculomotor symptoms are less significant, and lumbar puncture gives a slightly bloody liquid, but no pure blood.

When the bleeding is below the tentorium, the children are relatively quiet, with disturbances of respiration and cyanosis during the attacks, the lumbar puncture giving abundant blood in the fluid. The tension of the anterior fontanelle is lessened. There are no unilateral symptoms, but symptoms of irritation of the spinal cord are present. Cortical symptoms are secondary, resulting from blood stasis and edema.

The study of the symptoms suggest that in bleeding above the tentorium with progressive cerebral symptoms, trephining should immediately be performed. By the second or third day the obstetrician can determine whether the bleeding is still going on and death is inevitable, or whether it has ceased with a possibility of spontaneous recovery. In the latter case it is often impossible to accurately localize the hemorrhage, which may be so slight as to occasion no general cerebral symptoms.

Symptoms of cerebral pressure may develop from tension and injury to the brain substance at the base of the brain without hemorrhage. This was observed by Seitz in a case of difficult forceps extraction, with partial dilatation of the cervix, where the child was subjected to prolonged pressure. Death ensued on the third day from progressive weakness and failure of respiration. Autopsy showed only hyperemia, and very small points of ecchymosis.

Attention is also drawn to *spasm in the newborn through auto-intoxication*. This is seen in eclampsia, tetanus, alkaloidal poisoning, alcoholism, lead poisoning, and intoxication with carbonic acid gas.

Convulsions are often brought about by external irritation, as seen in cases where an overheated room excites the infant's nervous system.

The same reasons which produce eclampsia in the mother produce eclampsia in the child, and Esch has collected in addition to 2 cases of his own, 23 of maternal and fetal eclampsia, and 6 of eclampsia in the child where the mother escaped with albuminuria only. It is also observed that stillborn children of eclamptic mothers have rigor mortis. In 34 cases of intrauterine rigor mortis observed by Wolf, 8 had eclamptic mothers.

In attempting to make a *prognosis* in organic and functional spasm, it will depend entirely upon the cause of the spasm. If this be not serious and capable of removal, the child may recover.

The *treatment* consists in operation in favorable cases of supratentorial bleeding and syphilitic hydrocephalus. The child must be kept free from all reflex disturbances, and small doses of bromide and chloral given by rectum. When the anterior fontanelle is distended, lumbar puncture may be performed. In cases of auto-intoxication, eliminative treatment is necessary.

The bulbar nuclei in the nervous system in the newborn may by their diseased condition produce spasm. Such are cases of icterus, where the nervous centres have been found discolored by bile and greatly altered. In these cases icterus develops during the first day of life, followed by tonic spasms, inability to swallow, and disturbance of respiration. These cases are usually fatal. Necrosis of the ganglia is observed in some cases. Disease of the centres producing swallowing and stimulating respiration, accounts for the symptoms. In some cases, enteritis seems to furnish the poison which produces this condition. In other cases, the altered condition of the bile which accompanies the icterus produces enteritis. Bacteria are not found in the intestine, and the ganglion cells of the sympathetic nervous system are not affected. In these cases the prognosis is the worst possible.

Congenital aplasia in the bulbar region may produce lesions in the nerves supplying the eyes, mouth, and tongue.

In some cases, polioencephalitis at the base produces spasms, with disturbances of swallowing, respiration, pulse, and functions of the

eyes, mouth, and tongue. Indirect irritation of the bulbar centres through pressure arises only in bleeding beneath the tentorium. In this the convulsive centre is irritated, and the bulbar symptoms arise from pressure upon the different centres. The presence or absence of icterus makes the diagnosis between the two varieties possible. Should a child show symptoms of hemorrhage with icterus, lumbar puncture would clear up the diagnosis.

Considerable hemorrhage into the brain substance may also cause spasm in the newborn.

Weyhe, in 122 cases of intracranial hemorrhage in the newborn, found 35 into the substance of the cerebrum and 3 into the substance of the cerebellum.

Among his cases of hemorrhage into the cerebellum was one occurring on the second day after birth, with the clinical diagnosis of intermeningeal bleeding. Autopsy showed hemorrhage into the large ganglia of the brain, the cerebrum, and lateral ventricles. In a child dying at the age of four months, evidences of hemorrhage into the cerebellum occurring during or immediately after birth were found.

The third case, a newborn child, perished an hour and a half after delivery by version and extraction, with a diagnosis of asphyxia. Upon autopsy, profuse bleeding into the cranium and spinal canal were found, with hemorrhage into the substance of the cerebellum and extravasation of blood at the base of the brain.

Hemorrhage may occur beneath the tentorium, occasioning symptoms of bulbar compression. This is illustrated by Seitz's¹ case. This child died forty-two hours after spontaneous birth, with slight asphyxia. Just before death it was suddenly taken with cyanosis and failure of respiration, with spasm of the muscles of the extremities, opisthotonos, and clonic spasm in various groups of muscles.

Autopsy showed bleeding over the cerebellum and medulla. When bleeding beneath the tentorium is profuse, death usually occurs, with symptoms of paralysis of the respiratory centre.

Functional spasm in newborn infants may also develop as a result of lobar pneumonia following umbilical infection.

Congenital Ectopia Cordis. Rieländer² reports the case of a multipara who, during her pregnancy, had suffered a severe fright. At labor the fetus presented in breech presentation, and there was considerable hemorrhage during labor. The child was easily extracted by the midwife in attendance.

The fetus was but 23 cm. in length, although the mother thought the pregnancy in the twenty-sixth week. The heart was outside the chest, apparently attached to the body by a band of amnion which divided itself into two strands. One of these passed into the mouth and was

¹ Zentralblatt f. Gynäkologie, 1907, No. 30.

² Archiv f. Gynäkologie, 1909, Band lxxxviii, Heft 1.

attached to the hard palate, while the other passed upward to the region of the nose. It then became broader and blended with the amnion in the membranes. Tension upon these amniotic bands had displaced the heart so that the apex of the heart pointed upward on a level with the mouth. The right lower jaw was displaced so that the heart rested in a socket partially composed of the mouth. At the base of the heart the vena cava, inferior and superior, could be made out, while the other vessels seemed to be blended in the heart itself. The child was macerated so that its circulation could not be completely studied. The aorta and pulmonary artery were not separated, but the pulmonary vessels were developed in their passage to the lungs. The aorta proceeded in a curve toward the right, giving off the carotid vessels, the right subclavian and the left subclavian, with the right bronchus. The intercostal arteries and those of the abdomen were normal. There were no abnormalities in the vessels of the extremities.

Congenital Defects in the Cranium Caused by Amniotic Adhesions. Kehrer¹ has collected 33 cases of this condition. These defects are usually found at the vertex of the cranium along the sagittal suture and near the smaller fontanelle, or anterior to the greater fontanelle. The size of the defects varies greatly, from that of a small coin to that of the head of a large pin. The defects in the skin of the cranium are usually circular in shape. In a few cases the shape is irregular. There was also a lack of development in the hair, which may disappear in a few weeks after birth. In some cases the defects are permanent. These defects are usually surrounded by a ridge or border of scar-like tissue. In some cases, the defects resemble an open wound which may suppurate if the labor has been delayed. In other cases, scar tissue of various forms develops. In many of these children other malformations are present.

This condition is evidently of importance from the medicolegal standpoint, in distinguishing these congenital defects from wounds made in an endeavor to produce infanticide. The same conditions can obtain in other portions of the body, wherever the amnion may come in contact with a considerable portion of the fetal tissue. The condition in the cranium is more frequent than has been supposed. The fact that the amnion is not ruptured at birth gives no indication concerning the development of these conditions. Such bands frequently disappear immediately after labor.

Melena Neonatorum. Vassmer² has collected 66 cases of melena neonatorum, and adds the 67th from his own observation.

His case was a healthy female infant, born of a healthy mother in normal labor. The child was not asphyxiated at birth, nor did the amniotic liquid contain blood. The placenta was expelled by expres-

¹ Monatsschrift f. Geburtshülfe und Gynäkologie, 1910, Band xxxi, Heft 2.

² Archiv f. Gynäkologie, 1909, Band lxxxix, Heft 2.

sion intact with the membranes and without coagulum. On the night following its birth, after taking sterile water, the child vomited blood several times, and on the following morning decomposed blood was found with meconium in its stools. At the first blood the child seemed slightly anemic, the extremities remained warm, and under good care the child gained in weight during the next eight days.

The treatment consisted in subcutaneous injections of 20 c.c. of 2 per cent. gelatin, prepared by Merck, 10 c.c. in the right and 10 c.c. in the left scapular region. The same mixture was given to the child internally, in addition to milk from the mother's breast, and prepared cow's milk.

At the time of the first hemorrhage, 3 drops of 1 to 1000 solution of adrenalin were given twice, and during the night of the second day of its illness. The treatment was well borne by the child. The urine examined on the third day contained no albumin, there was no increase in temperature by rectum, and the bleeding did not return. The child made a good recovery.

In his collection of cases, two must be taken as spurious melena. In one of these the child had swallowed blood from the rupture of placental vessels; and in the second case, the child swallowed blood because of the deep attachment of the placenta. In one of these cases the child was delivered by breech presentation, and the nose, mouth, and trachea at birth contained abundant blood.

In two cases a local cause could be found for the bleeding, namely, nasal hemorrhage. This seemed to have resulted from birth pressure, causing rupture of bloodvessels in the nose from excessive uterine contractions. These cases were treated by a tampon in the nostrils with feripyrin gauze.

Forty-one of these children recovered, and in these no definite reason could be found for the hemorrhage. In one case the mother was said to be a bleeder, and in another case the mother was said to have hemorrhage very readily. As the hemorrhage persisted but a short time in both of these cases, the mothers could not be considered hemophiliacs. In the remainder of the 41 cases the bleeding could only be explained by hyperemia of the mucous membrane of the stomach and intestines, resulting from changes in the circulation produced by birth. None of these children who recovered showed evidences of irritation or paresis of the cerebral centres; 7 of them were delivered artificially; and in one case a face presentation was changed by manipulation to a vertex. In one case combined version was performed for uterine inertia and altered fetal heart sounds. In 2 cases the forceps was used for moderate pelvic contraction and altered heart sounds; and 3 cases were breech presentations. But one of these children was born asphyxiated.

Schatz and Czigler explain these cases by catarrh of the mucous membrane of the stomach and of the intestine, which in mild cases pro-

duces temporary icterus, and in severe cases causes bleeding. In Czigler's case two ulcers were found about the ileocecal valve, which might have been the source of the blood. In one case proceeding fatally, examination of the intestines showed a condition which must have begun before the birth of the child.

That such bleeding can readily occur from the intestines without ulcers, is shown by Audrey,¹ who, in 100 autopsies, found gastrointestinal hemorrhage without ulcer in 14 cases.

Hemholz found atrophy of the intestinal wall with small peptic ulcers caused by multiple thrombi. In other cases multiple hemorrhage in various organs must be ascribed to asphyxia, or to some of the methods like Schultze's for the treatment of asphyxia. In some children a predisposition to bleeding is present at birth, as shown by Stumpf and Sicherer, who found in 200 cases hemorrhage in 42 infants during the first twenty-four hours of life. In 182 of these children asphyxia was not present; 34 of the cases were premature, and among these 11, or 32.35 per cent., had hemorrhages into the eyes; while among the 166 born at full term, 31, or 18.67 per cent., showed ocular bleeding.

The fact that premature children are disposed to cerebral and other bleeding in nerve centres is shown by Couvelaire in his series of autopsies on 33 premature infants. In these cases there were no symptoms of melena.

Landau's theory that melena results from embolism in the arteries of the mucous membrane of the stomach and intestines, caused by thrombosis of the umbilical vein, seems consistent with the lesions found at autopsy in the gastrointestinal mucous membrane.

In Vassmer's series, 22 cases ended fatally, and in 20 of these hemorrhage was from the stomach and intestine. In 3, there was deficient formation in the heart with secondary stasis of blood. In 2 of the cases there was also a deficient formation of the intestine with duodenal stenosis, occlusion, and secondary dilatation of the duodenum, with pressure upon the portal vein. In one case there were two small ulcers in the stomach with sharply defined edges. In one fatal case an angioma was found in the mesentery between the jejunum and the ileum. This produced compression of a loop of intestine resulting in hyperemia. In 12 cases there was a distinctly localized ulcerating portion in the mucous membrane of the œsophagus, stomach, and intestine, and in 3 in the intestine only. A similar condition was observed in the stomach only in 4 cases, in the duodenum in 5, in the ileum in 1. The degree in which this process extended into the gastrointestinal tissues varied greatly.

It is possible that this condition results from infection, occurring through the placenta during fetal life. The fact that some of these

¹ Zentralblatt f. Gynäkologie, 1902, p. 247.

children had elevation of temperature would indicate a toxic condition and give strength to this theory. In the majority of cases no evidence of infection could be detected.

In one of the fatal cases there was invagination of the intestine; in one, syphilis; and in one no anatomical lesion could be found for a fatal issue. These children lived but eleven hours after the hemorrhage, probably too short a time for characteristic lesions to develop.

In the 67 cases there was vomiting of blood in 6 during the first three days of the hemorrhage; 5 of these 6 cases ended fatally, 3 of them having malformation of the heart, 1 occlusion of the duodenum, 1 erosion of the mucous membrane of the stomach with dilatation of the ductus venosus.

In 20 cases blood was found only in the spleen; 1 of these had bleeding during birth; 3 during the first day; 9 the second day; 5 the third day; and 1 on the fourth and fifth day. The average time of the bleeding from the intestine was two days and seven hours after birth. Intestinal hemorrhage persisted on the average for two days, and in 2 of these cases a fatal issue followed. In 32 cases blood was vomited and also passed from the intestine. On the average, hemorrhage ceased in two days and nine hours after the child's birth.

Of the 20 cases having intestinal hemorrhage, 13 died, 9 from ulcers in various portions of the digestive tract, 1 from stenosis of the œsophagus, 1 from invagination of the intestine, 1 from syphilis, 1 without demonstrable lesion.

As regards the mortality in prognosis, in the 20 cases in which blood was found in the stools, 10 per cent. died; in 6 cases in which blood was vomited, 83.3 per cent. died; in 37 cases in which blood was vomited, and found also in the stools, the mortality was 35.1 per cent. The average weight of the child was about 3000 grams.

The entire mortality of the 67 cases was 22, or 32.8 per cent. This is less than the statistics given by Anders, 56 per cent. mortality; Denser, 55 per cent. mortality; Rillet and Barthez, 47 per cent. mortality; Holt-schmidt, 50 per cent. mortality.

Of the 67 cases, 34 were treated by the use of gelatin, with a mortality of 8.8 per cent.; 31 cases were treated without gelatin, with a mortality of 19, or 61.3 per cent. The average duration of the hemorrhage in the gelatin treated cases was two days; in 6 otherwise treated, 2.7 days.

The difference in these treatments must be explained in part by the varying severity of the cases. Other methods of treatment employed were the administration of chloride of iron by the mouth in 4 cases; ergotin hypodermically by the mouth in 2; opium in 1; adrenalin in 1; gelatin by the mouth in 1; ergotin subcutaneously with inhalation of oxygen in 1.

In using gelatin subcutaneously, most of the cases were treated by a 1 or 2 per cent. solution. In 2 cases a 5 per cent. solution was used;

and in 1 case 10 per cent. This was prepared by Merck and was carefully sterilized, and given in doses of 10 c.c. The weaker doses were used three or four times daily. Gelatin may also be used by the mouth or by injection into the rectum.

This method may be considered as harmless when the kidneys are healthy, although dangerous in cases of nephritis.

The Causes of Death of the Viable Fetus Before Labor. Dorman¹ has analyzed the fetal deaths antipartum in 10,000 consecutive deliveries at the Sloane Maternity.

A series of 229 cases was secured. Among these, death occurred from unexplained conditions in 62, syphilis was unquestionably present in 24, and probably present in 24; in 47 toxemia, eclampsia, or albuminuria was the cause of fetal death; there were 30 cases of accidental hemorrhage, and of these 14 were without albuminuria; asphyxia through the cord drawn tightly about the neck destroyed 17 children before birth; placenta prævia caused death in 9, malaise intoxication in the mother in 6, and fibroid tumors of the mother's uterus caused fetal death in 4.

On the side of the fetus, ascites preceded intrauterine death in 4; hydramnios in 4; and congenital malformation in 5. Birth pressure and dry labor destroyed the fetus in 4 cases, and twisting of the cord in 2; intrauterine gonorrhea caused death by infection in 2 cases; there was 1 case each of death from carcinoma, stenosis of the cord, ectopic gestation, and fever from unknown causes.

Seitz² found that 65 per cent. of children dying during labor perish as the result of resistance to dilatation in the mother's birth canal. In 35 per cent., defective development and stenosis were present, and in 30 per cent. placenta prævia, eclampsia, or prolapse of the cord. The fetal mortality in labor is much greater with primiparæ than with multiparæ. The longer the expulsive period persists, the greater is the danger to the child.

Seitz estimates that in Germany, in uncomplicated vertex presentations, 16,000 children die each year because of some complication or abnormality connected with the birth canal of the mother.

The Passage of Clinical Substances from Mother to Fetus. Nicloux³ contributes an extensive article, reviewing this subject. Concerning some of the substances studied, there was much of clinical interests in the paper.

As regards *carbon oxid*, Nicloux studied the fatal dose for the young by progressively adding carbon oxide to the air breathed by the maternal animal. He found that when one part of the toxic gas to 1000 parts of atmospheric air were administered, and one part of the toxic gas to

¹ American Journal of Obstetrics, February, 1909.

² Monatsschrift f. Geburtshülfe und Gynäkologie, 1909, Band xxx, Heft 4.

³ L'Obstetrique, November, 1909.

10,000 parts of air, that the blood of the mother and young showed identical portions of carbon oxide. When more than 1 to 1000 was given, the quantity of the gas in the fetal blood was less than that in the mother, and this difference became greater until the death of the fetus occurred. The capacity of the fetal blood for absorbing carbon oxide seems to be quickly exhausted.

In studying the effects of *chloroform*, he found that chloroform passes from mother to fetus very rapidly, anesthesia developing in two months after a pre-anesthetic period of five months, when one can demonstrate the presence of the anesthetic in the fetal liver. Chloroform shows a remarkable affinity for the fat in fetal tissue, and it also has a remarkable affinity for lecithin and tissues containing it. *Ether* behaves in a similar manner in mother and fetus. The quantity of ether contained in the fetal liver is greater than that in the maternal liver, probably because lecithin is more abundant in the fetal liver.

In studying the chemical substances, it was found that they proceeded by dialysis through the placenta in proportion as the substances were capable of dialysis through animal membranes.

In studying the effects of *alcohol* in various forms, alcohol was given to the mother one hour before the termination of labor. It was obtained after labor in the blood taken from the cord and from the placenta.

Alcohol was also found in the glands and genital secretions of the fetus, constituting a form of alcoholism which Nieloux names congenital.

Malformations of the Extremities in the Newborn. Mayer¹ reports the case of a child born in spontaneous labor, the mother giving a history of good health, and no occurrence of malformations in her family.

On both hands on the ulnar side, the child had, proceeding from the skin of the little finger, a small mass as large as a hazel nut covered with normal skin, and with a well-developed nail. No bony tissue could be detected in this mass.

After its removal, microscopic examination showed skin, fat, muscular and connective tissue, with a faint trace of bony deposit.

He also calls attention to deformity produced by amniotic bands in causing the formation of clots in the decidua reflexa, and thus making pressure upon the embryonal extremities.

He cites the case of a child born in face presentation, the placenta and membranes being apparently normal, and the amount of amniotic liquid not excessive. The child was well developed, with the exception of the right leg. Apparently the right thigh was absent. The leg and well-formed foot seemed to be attached directly to the anterior abdominal wall and was movable. Upon palpating the right hip, a slight thickening was felt in the right anterior pelvic wall. The bony tissue could not be made out in this locality.

Examination with the Röntgen ray showed a normal leg with the

¹ Monatsschrift f. Geburtshülfe und Gynäkologie, 1910, Band xxxi, Heft 1.

tibia and fibula attached directly to the anterior pelvic wall. No trace could be found of the thigh. When the child was placed upon its abdomen a long shaft of bony tissue could be made out which extended underneath and parallel to the right ischium. This seemed to be the shaft of the missing femur.

Mayer also reports the case of a fetus, the upper part of whose body was normal, with the exception of a large umbilical hernia. The inferior extremities were practically divided into three portions by amniotic bands. One of these of considerable depth extended from the umbilical hernia to the groove between the middle and inferior third of the thigh.

The Röntgen ray showed that the bones were of normal shape and development.

Nephritis in the Newborn. Kosmak¹ reports the case of a male infant spontaneously born in normal labor. The mother made an uninterrupted recovery.

On the third day the child's temperature rose slightly; on the following day the stools were green, containing mucus, and were two or three in number daily. The temperature reached 104° F. on the eighth day. The urine diminished and was dark colored. The child continued to lose in weight, and on the seventh day edema of the feet developed, and puffiness of the face on the twelfth day. The edema became general, and the child remained in a semicomatose condition. The temperature declined after the eighth day, until on the sixteenth day it was practically normal. The color of the stools improved and the child began to gain in weight.

Specimens of urine were examined after the twelfth day, showing traces of albumin, acetone, mucus, blood, and occasional blood cells. There were no hyaline casts after the eighteenth day.

The child remained in a comatose condition, the skin over the extremities becoming tightly stretched and assuming a glassy appearance. Death ensued with dyspnea and general cyanosis on the twenty-second day.

Upon autopsy the kidneys were slightly increased in size and pale in color. The capsule stripped readily, leaving a pale, slightly opaque surface. The cortex and medulla could not be clearly distinguished. The cortex was pale, bulging slightly beyond the capsule, and irregularly marked. The mucous membrane of the pelvis of the kidney was normal. The mucous membrane of the large intestine was moderately swollen and covered by mucus.

Microscopic examination showed the epithelium of the convoluted tubules swollen and finely granular. No exudate could be made out in the glomeruli. Death resulted from acute parenchymatous nephritis, mucous colitis, and hypoplasia of the glands of the body. It was thought that the initial condition was a severe colitis, possibly resulting from bacteria in the mother's milk.

¹ Bulletin of the Lying-in Hospital of the City of New York, No. 4, 1909.

DISEASES OF THE NERVOUS SYSTEM.

BY WILLIAM G. SPILLER, M.D.

DISEASES OF THE BRAIN.

Brain Tumor. CHOKED DISK. Leslie Paton¹ has analyzed the records of 200 cases of brain tumor as regards papilledema, and gives as his conclusions:

1. Tumors directly or indirectly exercising constant pressure on the chiasma, or on the optic nerves, may cause primary pressure atrophy without any preceding edema of the disk.

2. The great majority of tumors affecting the gray matter of the cortex cerebri cause optic neuritis, the severity of which seems to vary inversely with the distance of the part affected from the chiasma.

3. Tumors lying deep in the white matter of the cerebral hemispheres do not, as a rule, produce optic neuritis until they invade either the cortex or the basal ganglia. They are most likely to produce optic neuritis when they spread in the latter direction.

4. Tumors affecting the optic thalamus, the mid-brain, the cerebellum, and the ventricles, are almost invariably associated with optic neuritis.

5. Pontile tumors, and some extracerebellar tumors which are closely allied to pontile tumors, do not produce optic neuritis until neighboring regions, especially the cerebellum, are invaded.

6. A difference in the intensity of the neuritis in the two eyes is met with in about 50 per cent. of all cases. The neuritis in some cases is greater in the eye on the side of the tumor, and in some cases is greater in the opposite eye. When a difference exists, it should not be regarded as of localizing value.

7. The nature of a tumor does not in itself play any part in determining the onset of neuritis, except in so far as the nature of the tumor determines its location.

8. A close relationship seems to exist between the occurrence of neuritis and the amount of intracranial tension, but there is as yet nothing to justify us in saying that the relationship is one of cause and effect.

9. Meningeal inflammation is rare in cerebral tumors, and when it does occur is, in the majority of cases, localized to the actual tumor area and plays no part in the causation of optic neuritis.

¹ Brain, 1909, xxxii, p. 65.

10. There are reasons for thinking that the diminution of visual acuity and the edema of the optic nerve head are more or less independent of one another, and are not related to one another as cause and effect.

11. The atrophy of the nerve, in some cases at least, is probably a simple pressure or descending atrophy starting from the chiasmal end of the nerve and exactly analogous to the primary atrophies which occur quite apart from any edema of the disk.

12. Age, in itself, has little or no relationship to the occurrence of neuritis.

Sir Victor Horsley¹ has reached conclusions differing from those of Leslie Paton, and still maintains the localizing value of papilledema. He says, in the summary to his paper, that the maximal intensity and age of the papilledema in cases of increased intracranial tension is of the highest value in clinical localization of the lesion, and is ipsilateral with the maximal pressure effects of the latter.

Papilledema, produced by increased intracranial tension, commences at the upper border of the optic papilla, and invades last the inferior temporal quadrant.

To these remarks Mr. Leslie Paton replies. He refers to his previous paper. In 54 cases, the swelling was equal or the difference did not exceed 0.5 D. In 25 cases, the swelling was greater on the side of the tumor, and in 23 it was greater in the opposite eye. In 3 cases, only one eye was affected at the time of death or operation, and in each of these it was the contralateral eye. In 11 cases, the difference in the swelling was more than 2 D., and in 7 of these it was the contralateral eye that was most affected. Paton does not lay the stress on the hemorrhagic character of the disk that Horsley does, but the former finds that out of 17 cases where hemorrhages appeared in only one eye, 5 showed hemorrhages only in the contralateral eye.

There is one indication of the age of neuritis which is of indisputable value, and that is direct observation of its commencement. In 30 of the cases reported by Paton, the neuritis started while the patients were in the hospital. In 13 of these, disk changes were observed simultaneously in both eyes. In 6, the changes appeared first in the eye of the same side as the tumor, and in 11, in the eye on the side away from the tumor.

Paton² says he does not seek to prove that the eye on the side of the tumor may not be more frequently affected than the opposite eye, but he wishes to insist that in a very definite percentage of cases it is the opposite eye that is first and most affected, and that the percentage of cases in which this happens is too large to allow us to use the side of onset for localizing purposes.

¹ British Medical Journal, March 5, 1910, p. 553.

² Ibid., March 12, 1910, p. 664.

TUMOR OF OCCIPITAL LOBE. The tumor of the occipital lobe reported by Wendenburg¹ has some interesting peculiarities. Mind blindness was present, although the tumor was confined to the right cerebral hemisphere; this is certainly noteworthy. Edema of the soft tissues and enlargement of one of the surface vessels were seen over the tumor. The case showed also that an occipital tumor may cause bilateral cerebral atrophy of the upper limbs, even greater in the limb on the same side as the tumor. The nature of this cerebral muscular atrophy is not understood, and therefore no satisfactory explanation can be found for greater atrophy in a limb having its chief representation in the cerebral hemisphere opposite to that in which the tumor is situated.

The difficulty that may occur in localizing a brain tumor is shown especially well in a case of tumor of the occipital lobe reported by Lasarew.² Vomiting, severe headache, and choked disk made the diagnosis of tumor probable, unless internal hydrocephalus was the cause of these general symptoms. The localizing symptoms were paresthesia in the distribution of the left trigeminal nerve and blowing sound in the right ear. Ataxia of cerebellar character was present. The tumor was supposed to be in the right cerebellopontile angle. Paresis of the left upper and lower limbs could be explained by a tumor in this location, and feeble nystagmus strengthened the diagnosis. The trigeminal paresthesia on the side opposite to the seat of the supposed tumor is not an unusual finding.

The tumor was discovered at necropsy in the right occipital lobe. Visual hallucinations, or mind blindness, had not been present. Observation of the case began after blindness had developed, so that the presence of hemianopsia could not be determined. The symptoms supposed to be localizing were misleading, and were the result of distant pressure, and yet this pressure does not appear to have been great, as the tumor was only the size of a walnut. There was no severe hydrocephalus complicating the condition.

This case illustrates what is well recognized, viz., that the most valuable localizing symptoms of tumor are those which appear early in the disease. Hemianopsia as the first sign in this case would have made a tumor of the posterior cranial fossa improbable.

TUMOR OF THE BASE OF THE FRONTAL LOBE. In a case of brain tumor recently described by Gowers,³ papilledema of moderate intensity was seen in the right eye, but there was no trace of neuritis in the left eye, although there was in this eye a small central scotoma for both white and colors, and the disk presented a grayish appearance. Very dim vision existed around the scotoma. The condition was that occurring in retrobulbar neuritis. There was also loss of smell on the left side.

¹ *Monatsschrift f. Psychiatrie und Neurologie*, May, 1909, p. 428.

² *Deutsche Zeitschrift f. Nervenheilkunde*, vol. xxxix, Nos. 1 and 2, p. 130.

³ *Lancet*, July, 10, 1909, p. 65.

As optic neuritis was present in the right eye with signs of retrobulbar neuritis in the left, with loss of smell on the left side and general signs of tumor, a diagnosis of tumor in the front of the base of the brain, exerting pressure on the left side, was made. Operation was attempted, but resulted fatally, and the tumor was found in the position diagnosed. The pressure on the left optic nerve by the growth was much greater than that on the right nerve.

Gowers refers to unilateral ocular neuritis produced by gout, and states: "We cannot doubt that the gout is an occasional cause of retro-ocular inflammation, and therefore that this diathesis may sometimes cause it within the eye." When uniocular neuritis occurs, and suggests, by its aspect that it might be due to a cerebral tumor, there is generally reason to think that it may be the consequence of some general cause. Headache which does not disturb sleep, Gowers thinks, cannot be regarded alone as evidence of organic brain disease. He has observed unilateral optic neuritis as the result of gas poisoning in a man who had been working in coal mines.

FRONTAL TUMOR CAUSING SYMPTOMS OF CEREBELLAR TUMOR. It is not often that the symptoms of a tumor of the frontal lobe suggest a growth in the posterior portion of the brain, but occasionally such an occurrence is recorded. In a case of this kind reported by Ruckert,¹ in addition to the general symptoms of tumor, there were tinnitus aurium, tenderness to pressure over the right parietal bone, tenderness of the upper division of each trigeminal nerve, weakness of the right facial nerve, nystagmus, progressive deafness in the right ear, and later in the left; ataxic gait, and later, loss of tendon reflexes in the lower limbs. The diagnosis of tumor of the posterior cranial fossa was made, and in view of the fact that the early symptoms were indicative of a lesion in this region, the mistake seems almost unavoidable. Bruns and Oppenheim have shown that the differential diagnosis between tumor of the cerebellum and tumor of the frontal lobe may be very difficult.

The necropsy in Ruckert's case revealed a tumor in both frontal lobes, but more in the right. The microscopic examination demonstrated that the acoustic nerve was partially degenerated, and the symptoms were interpreted as the result of general intracranial pressure and comparable with papilledema. A somewhat similar case was reported by Souques in 1904. Whether the pressure is exerted within the cranium or within the labyrinth is uncertain. No evidences of internal hydrocephalus were found in Ruckert's case, but the fluid between the dura and pia was somewhat increased in amount, a sign of questionable importance.

The chief interest in this case lies in the demonstration that focal symptoms possibly may be produced by general increase of intracranial pressure.

¹ Berliner klin. Wochenschrift, July 5, 1909, p. 1248.

TUMOR OF THE HYPOPHYSIS. Hemianopsia is common in disease of the hypophysis, especially in acromegaly, but the statement of Lapersonne and Cantonnet,¹ viz., that bitemporal hemianopsia scarcely ever fails in acromegaly, may be questioned. One sees a number of cases of acromegaly, especially in the early stages, in which bitemporal hemianopsia does not occur. These writers report a case of tumor of the hypophysis with homonymous lateral hemianopsia, in which an *x*-ray photograph showed enlargement of the sella turcica; the anterior portions of this cavity were well defined, but the posterior portions were indistinct. Homonymous lateral hemianopsia is rare in tumor of the hypophysis, and is explained in this case by the development of the tumor at the posterior part.

Lapersonne and Cantonnet refer to the occurrence of bitemporal hemianopsia in myxedema as a result of compensatory enlargement of the hypophysis following disease of the thyroid gland.

Tumors of the hypophysis afford more opportunity for diagnosis by the *x*-rays than do most of the growths located elsewhere in the brain. This is because of the changes produced in the bone beneath the tumor. The cases in which the *x*-rays have been useful, however, are not numerous. In one reported by Crzellitzer,² the photograph showed enlargement of the sella turcica. Right paracentral scotoma and left central scotoma were found, with bilateral contracture of the fields. The central scotoma must have been caused by pressure. There were also headache, anesthesia of the right cornea, paralysis of convergence, paralysis of the left iris, and weakness of the right facial nerve.

I have seen symptoms associated with those of tumor of the hypophysis that could be explained possibly by disturbance of the intraventricular fluid.

BINASAL HEMIANOPSIA. Bowman³ has collected the reports of 18 cases of binasal hemianopsia. In only a few was contraction of the temporal fields observed, but in almost all there was atrophy of the optic nerves or neuritis. In some instances, the binasal hemianopsia later became complete blindness. The pathological condition was determined only in 4 cases; in 1, all the cerebral vessels were atheromatous, especially those of the circle of Willis; in another, a large tumor was found arising in the left hemisphere; in another, the brain was that of a paretic and the ventricles and infundibulum were enlarged; and in the fourth, a gumma was found in the optic tract and was associated with considerable exudate. In none of these cases was the binasal hemianopsia satisfactorily explained. Bowman comes to a conclusion different from that of some other investigators. He believes an anterior or lateral lesion of the chiasm may cause homony-

¹ *Revue Neurologique*, January 30, 1910, p. 120.

² *Berl. klin. Wochenschrift*, May 17, 1909, p. 921.

³ *Monatsschrift f. Psychiatrie und Neurologie*, May, 1909, p. 387.

mous lateral hemianopsia, or an inferior and median lesion may cause bitemporal hemianopsia, or—and herein he differs from some others—that a posterior or postero-superior lesion may cause binasal hemianopsia.

TUMOR SYMPTOMS FROM SWELLING OF THE HYPOPHYSIS. A most extraordinary case of recurrent symptoms like those of brain tumor is reported by W. Nolen.¹ A woman had the first cerebral symptoms during her twelfth pregnancy, they were: Drowsiness, left-side headache, right hemiparesis, tremor of the paretic right upper limb, and oculomotor paresis on the side opposite to the weakness of the limbs. All these symptoms disappeared a few weeks after the delivery. She had a miscarriage in the thirteenth pregnancy, but in the fourteenth pregnancy the same symptoms returned, and disappeared after the delivery. During the two years that have elapsed since the last pregnancy the symptoms have not returned. This symptom complex has been called by the name of Benedikt.

Numerous investigations have shown that the hypophysis is enlarged during pregnancy, and Nolen attributes the symptoms in his case to this enlargement. Plavec has attempted to show that recurrent ophthalmoplegic migraine is the result of swelling of the hypophysis. Nolen believes some abnormality in the hypophysis may explain the cerebral symptoms occasionally occurring in chlorosis.

TUMOR OF THE PINEAL GLAND. Our ability to diagnosticate tumor of the pineal gland has been much increased by recent investigations. According to v. Frankl-Hochwart,² a tumor of this structure, a teratoma, may be recognized when in a young person the general symptoms of tumor are associated with the symptoms of tumor of the corpora quadrigemina (paralysis of ocular muscles, paralysis of associated ocular movements, ataxia) and abnormal growth in length, unusual development of hair and of fat, somnolence, premature development of the genital organs and of sexual function, and early development of the mental faculties. One may indeed express surprise when he reads of such important functions being influenced in any way by so small a structure as the pineal gland.

The diagnosis from tumor of the hypophysis without acromegaly may be difficult, as many of these symptoms may be caused by a tumor of this gland. The growth is more likely to be in the pineal gland when hypertrophy of the genital organs, unusual development of the pubic and axillary hair, and sexual excitement exist. Tumor of the hypophysis is likely to impair sexual function, and bitemporal hemianopsia, with enlargement of the sella turcica shown by the *x*-rays, makes the diagnosis easy.

The pineal gland has an importance probably only in early childhood, as involution occurs before puberty. It probably has an inhibitory

¹ Berl. klin. Wochenschrift, 1909, Nos. 49 and 50.

² Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxvii, Nos. 5 and 6.

action upon genital function, and, when diseased, hypertrophy of the genitalia occurs. When the pituitary body is diseased, on the contrary the genital system is arrested in its development.

TUMOR OF THE CEREBELLOPONTILE ANGLE. Starr's¹ paper on tumor of the acoustic nerve is a valuable contribution. He has had 13 cases, 11 of which were with operation. He divides the symptoms into three classes: (1) Those referable to the cranial nerves; (2) Those referable to the involvement of the cerebellar peduncles; and (3) those referable to compression of the tracts passing through the pons. These groups of symptoms are described in detail, but space does not permit of their repetition here. Interesting is his explanation of the displacement of the head in cerebellar tumor. A tumor at this location is very near to the centre of gravity of the head, and it can be readily imagined that a tumor growing backward might so disturb the equilibrium of the head as to lead to an abnormal position, which might be backward, but would naturally be more toward the side of the tumor than away from it.

The most interesting feature of this interesting paper is the report of recovery after operation with removal of a tumor of the cerebello-pontile angle by Cushing, on May 20, 1909. On February 5, 1910, the patient had no choked disks, the retinae appeared to be normal, the visual field was perfect for light and color, she walked perfectly well, without any tendency to stagger; she had no vertigo, no headache, no anesthesia or weakness of any part of the face or body. She had, however, nystagmus upon lateral motion of both eyes, slight deafness to the tuning-fork and to air conduction in the left ear, and exaggeration of both knee-jerks, but no ankle clonus, and she felt perfectly well. The marked exophthalmos which had been present had gradually subsided, so that there was no trace of it, and winking was symmetrical on both sides. The recovery may be said to have been almost complete.

Starr discusses the surgical procedures for removal of tumors of the cerebellum and acoustic nerve, but the matter probably will be referred to elsewhere in *PROGRESSIVE MEDICINE*.

Tumor of the cerebellopontile angle does not usually give the symptoms observed by Oppenheim² in one of his cases. His patient had signs that almost anyone would regard as indicative of a tumor in the left cerebellopontile angle, and yet the Wassermann reaction was positive, and recovery apparently occurred after treatment with mercury. After some months, the symptoms returned, but strange to say, with left hemiparesis, clonus and Babinski's sign on the left side, and left hemianalgesia. The left hemiparesis might be attributed to pressure on the pyramidal tract below the motor decussation, but as pontile symptoms were present, it seemed improbable that the tumor extended so far downward. Oppenheim attributed the left hemiparesis to pressure on

¹ American Journal of the Medical Sciences, April 1910, p. 551.

² Neurologisches Centralblatt, April 1, 1910, p. 338.

the contralateral (right) pons and medulla oblongata against the base of the skull. A fibroma was removed from the left cerebellopontile angle, but the operation resulted fatally. The posterior part of the right side of the pons was flattened and the right side of the medulla oblongata was atrophied. The right vertebral artery had made a furrow in the medulla oblongata above the motor decussation.

The positive Wassermann reaction and the results of mercurial treatment made the case obscure. The symptoms produced by pressure of the side of the brain opposite to the tumor against the base of the skull, with escape of the pyramidal and sensory tracts on the side of the tumor, made the case still more obscure.

In a case of tumor of the cerebellopontile angle reported by Weisenburg,¹ the symptoms of chief interest relate to the glossopharyngeal and hypoglossal nerves. The Gasserian ganglion had been removed and yet pain persisted in the face on the side in which the ganglion had been excised. It was chiefly localized to the back of the tongue, and extended down the throat and to the ear. The man complained of a burning feeling in the throat, and occasionally of sensations which he likened to the crawling of roaches, of a constant dryness, and of a feeling of hot or ice-cold water. Eating caused pain, produced by the contact of the food with the posterior part of the mouth and by swallowing. Occasionally the pain in the throat would be so severe that the man felt as though he would choke to death. There was no weakness in the motor distribution of the glossopharyngeus. The pain was attributed to implication of the glossopharyngeus.

Involuntary movements of the tongue were attributed to irritation of the hypoglossal nerve. They occurred independently of voluntary movement but could be produced by forcible action of the tongue. The tip of the tongue would be pushed to the right (the tumor was on the right side) against the teeth, or the entire tongue would present a sort of rolling, curling movement to the right.

TUMOR OF THE PONS. A case of brain tumor recorded by Herringham and Howell² is important in that it seems to be the only case in which hemianalgesia and hemithermoanesthesia were produced by tumor of the brain, while the sensation of touch was preserved. The sensations of temperature and pain were lost on the right side of the body, while tactile sensation was preserved in these parts. Tactile sensation was lost over the left face and cheek from the eyebrow to below the mouth, and was weak over the forehead, temple, and lower jaw. The sensations of pain and temperature were preserved over these areas. Other symptoms were present. Two tumors were found at necropsy. The first occupied the sella turcica, and compressed the pons posteriorly; it was a myxosarcoma. The second was situated in the left cerebellopontile

¹ Journal of the American Medical Association, May 14, 1910, p. 1600.

² Lancet, January 29, 1910, p. 290.

angle, and extended throughout the inferior two-thirds of the pons; it was a glioma. The case shows that in the pons, as in the medulla oblongata, the fibers carrying impulses of pain, heat, and cold are still distinct from those carrying tactile sensations.

AREFLEXIA OF THE CORNEA. Oppenheim was the first to emphasize this sign as indicative of tumor of the posterior cranial fossa, and he speaks of it especially in connection with tumor of the cerebellum. It seems to be the first expression of pressure upon the trigeminal nerve, and may occur when the sensation of this nerve in the rest of the face is intact. Saenger¹ states that he has searched regularly for areflexia of the cornea in cases of tumor of the cerebellum or of the posterior cranial fossa, and has usually found it; sometimes it is bilateral. Kempner showed that areflexia of the cornea occurs in all diseases in which the trigeminal nerve is implicated, as in syringomyelia, multiple sclerosis, and tabes. It occurs also in hysteria. It has been seen also in lesions of the frontal lobe, probably as a result of pressure. Saenger has seen it in hemiplegia, abscess of the temporal lobe and subdural hematoma, on the side opposite to the lesion. It occurs more frequently, in Saenger's opinion, with lesions not causing increase of intracranial pressure. The lesion need not be basal, and Saenger believes the contralateral areflexia of the cornea probably is caused by implication of that portion of the cortex in which trigeminal fibers radiate. Unfortunately, we know little about this cortical region. It is remarkable, in view of his explanation, that in most cases the trigeminal area of the face remains intact except in the cornea, and Saenger thinks the cornea may have a richer, more extensive innervation than the rest of the trigeminal distribution and even a distinct sensory supply, all of which is purely theoretical.

RECURRING SYMPTOMS IN TUMOR. The case of tumor reported by Rudolf and Mackenzie² has some unusual features. The patient, a woman, had had severe headaches, and at the menopause the headaches lessened in severity, but the partial aphasia which she had had with the headaches persisted in modified form. She had an attack of what seemed to be acute cerebral compression without localizing symptoms. This passed off and for nearly ten weeks she was as well as before. The compression recurred, and again passed off, but recurred at intervals of a month, until the fifth resulted fatally. Between the attacks she seemed nearly well, and on the day before the fatal one, spoke unusually well and walked down stairs.

The case during the life of the patient seemed to be one of cerebral cyst which filled periodically, and after producing almost fatal compression emptied itself in some way. An endothelioma was found in the left parietal lobe, and another between the tentorium and the left occipital lobe. A few nodules were on the inner surface of the dura. The spas-

¹ *Neurologisches Centralblatt*, January 16, 1910, p. 66.

² *American Journal of the Medical Sciences*, November, 1909, p. 733.

ticity during the acute attacks was nearly always most marked on the left side, *i. e.*, the side on which were the tumors, and may have been caused, in the author's opinion, by cerebellar irritation from pressure of the tentorial tumor. The almost constant monthly recurrence of the acute compression suggests the possibility of the increased pressure being in some way connected with the menstrual function, although this had ceased over a year previously. Vasomotor disturbances are common at the menstrual periods and often persist after the menopause.

FLACCID PARALYSIS OF THE HEAD IN CEREBELLAR TUMOR. In a child with symptoms of cerebellar tumor observed by C. K. Mills,¹ the inability to hold the head erect was almost absolute, amounting to an extreme hypotonia or flaccid paralysis. It is well known, as he states, that in lesions of the cerebellum, especially tumor, the head sometimes tends to one side, and, according to many who have observed this phenomenon, it is away from the side of the lesion. Owing to the flaccidity or tonelessness of the muscles of the trunk and neck, the head and body may assume all sorts of abnormal positions in the effort of the patient to maintain balance, but Mills has never seen a case in which the inability to maintain the head in a fixed position was so marked as in this case which he reports.

ANEURYSM RESEMBLING TUMOR. The recognition of an intracranial aneurysm may be impossible during the life of the patient. In a case reported by Booth,² the symptoms were severe headache, tenderness to pressure at the base of the skull, stiffness of the neck, Kernig's sign, mental apathy, slowness of speech, convulsive seizures, and choked disks. A diagnosis of tumor of the brain was made, and decided improvement was obtained by antisyphilitic treatment. An aneurysm of the left anterior cerebral artery was found at necropsy, and the rupture of this was the immediate cause of death.

BRAIN TUMOR WITH MYELITIS. In a case of glioma of the cerebrum reported by Erich Behrenroth,³ the symptoms began with an apoplectic-form attack, and later signs of transverse myelitis appeared. The author accepts hemorrhage into a glioma as explanation of the sudden onset; and the softening within the tumor, and thereby relief of pressure, as explanation of the failure of marked increase in the symptoms, notwithstanding the tumor was still growing. Especially interesting in this case, however, was the occurrence of transverse myelitis after the first symptoms of brain tumor had appeared, but the relation of the two lesions to one another is not easy to determine. The symptoms would suggest metastasis from the cerebral tumor to the cord substance, and this diagnosis would be justifiable under such circumstances, but tumor of the spinal cord was not found at necropsy. Indeed, it is not clearly

¹ Journal of Nervous and Mental Disease, July, 1909, p. 402.

² Ibid., September, 1909, p. 528.

³ Monatsschrift f. Psychiatrie und Neurologie, July, 1909, p. 81.

established by the author that the myelitis was secondary to the brain tumor.

RISE IN TEMPERATURE FOLLOWING OPERATION FOR TUMOR. The rise in temperature which occurs after operation on the brain may follow the operation immediately or may be delayed for days and may attain a high degree. The cause for this hyperthermia is not very evident. George W. Jacoby¹ reports two cases in which it was marked, refers to similar cases in the literature, and gives theoretical explanations that have been advanced. He concludes that the neurogenic fever as encountered after brain operation is due to the action of toxins, emanating from retained blood clots, upon nerve cells from which inhibition has been removed or to which it has not yet been restored, from overstimulated or paralyzed cells. In the cases in which the hyperthermia has been of long duration, the hemorrhage during the operation has been great. It is not possible to prevent hemorrhage during an operation, but it is possible to carefully control the hemorrhage which does occur, to stop every bleeding point systematically, and, when the operation is finished, to clean the wound properly, so that no blood clots are left behind. When this is done, he is sure that fever, when it does occur, will be of the early kind, and will not be of long duration.

PSEUDOTUMOR OF THE BRAIN. This is a term employed for those cases in which the symptoms of brain tumor occur, but recovery or the absence of lesions at necropsy shows that the diagnosis of tumor was incorrect. Some of these cases are the result of hydrocephalus; in others, no microscopic examination was made. Finkelnburg and Eschbaum² report a case which they believe to be the first in which meningitis and degeneration of cranial nerves, not of tuberculous or syphilitic character, caused the symptoms of a tumor of the posterior cranial fossa. The lesions were recognizable only by the microscope, and were confined to the base of the brain. The symptoms were headache of the frontal and occipital regions, impairment of hearing, especially in the right ear, diplopia, vertigo, somnolence, incomplete bilateral optic atrophy, impairment of smell, diminution of the right conjunctival and corneal reflexes, hyperesthesia in the entire upper branch of the right trigeminal nerve, and paresis of the lower part of the right facial nerve. The symptoms of disturbed function in the acoustic, facial, and trigeminal nerves of the right side indicated a lesion of the posterior cranial fossa. It may be questioned whether the authors have satisfactorily excluded syphilis. They give the clinical histories of several other cases of pseudotumor, but as the diagnosis is more or less doubtful in these cases, they add little to our knowledge of the subject.

Higier³ reports 2 cases of pseudotumor. A boy at the age of six years

¹ Festschrift zur Vierzigjährigen Stiftungsfeier des Deutschen Hospitals in New York, 1909.

² Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxviii, Nos. 1 and 2, p. 35.

³ Neurologisches Centralblatt, April 1, 1910, p. 342.

had a severe cerebral disorder, lasting over a year, with headache, vomiting, Jacksonian epilepsy, dysphasia, hemiparesis, abducens paralysis, and choked disks. Recovery occurred, but thirteen years later similar symptoms appeared, and disappeared after nine months. The diagnosis was recurrent pseudotumor of the brain.

His second patient had similar symptoms twelve and five years before the third attack. The first attack lasted five months, the second three and a half months. In the first attack, choked disk resulted in optic atrophy.

Higier thinks the diagnosis of pseudotumor is unreliable:

1. When infection, tuberculosis, hereditary or acquired syphilis, concealed pus foci, severe anemia or cachexia, psychical or physical trauma occurs.

2. When acute onset or sudden death, elevation of temperature, enlargement of the skull, numerous remissions and intermissions, continued variation in intensity of symptoms, and great increase of cerebrospinal pressure, as shown by lumbar puncture, occur.

3. When recovery in a period of about two years after beginning of improvement is not observed.

4. When the examination of the brain is only macroscopic.

At best, however, the diagnosis of pseudotumor is little more than a pseudodiagnosis.

SUDDEN DEATH FROM BRAIN TUMOR. The cause of sudden death in cases of brain tumor is believed by some to be acute swelling of the brain. The same condition is responsible for the symptoms of pseudotumor and for cerebral symptoms developing in many diseases. The swelling apparently is not the result of mere edema, but is an intimate combination of the water in the brain with the brain tissue. The subject has been studied especially by Reichardt, and recently has been discussed by Apelt.¹

Localization. Extremely important as regards the motor area of the brain is a case reported recently by Sir Victor Horsley.² He marked out by electrical irritation the entire motor area for the upper limb in the gyrus precentralis, and excised this area. The patient had violent athetotic and convulsive movements in the upper limb of the opposite side. As a result of the operation, he was at first completely paralyzed in this limb, but soon began to recover some motion, and the improvement continued until he had acquired considerable motor power. Sensation in the limb also was much affected. The spasmodic movements of the upper limb ceased. The report was made thirteen months after the operation. Horsley concludes from the study of this exceedingly valuable case that:

¹ Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxix, Nos. 1 and 2, p. 119.

² British Medical Journal, July 17, 1909, p. 125.

1. The so-called motor area of the human cortex cerebri is really sensori-motor.

2. The gyrus precentralis is, in man, the seat of representation of (a) slight tactility, (b) topognosis, (c) muscular sense, (d) arthric sense, (e) stereognosis, (f) pain, (g) movement.

3. The gyrus postcentralis is, in man, part of the arm area in which the sensori-motor representation is of the same kind as that in the gyrus precentralis, but in it probably provision for sensorial coördination is greater, and that for efferent impulses less.

4. The giant pyramids, or Betz cells, are not essential for the performance of purposive or voluntary movements.

5. Purposive or voluntary movements can be performed after complete removal of the corresponding part of the gyrus precentralis.

It is indeed strange that a case like Horsley's in many respects is reported almost simultaneously by P. L. Friedrich.¹ The centre for the upper limb was defined by electrical irritation and excised, because the attack began in this limb. The excision was confined to the gyrus precentralis. The report was made six months after the operation, and up to that time a cure had been effected. Unlike Horsley's case, sensation was not altered in any way by excision of a large portion of the gyrus precentralis, but the author dismisses the results so far as sensation is concerned, in a few words. The remarkable return of motor power is explained as the result of "compensation," and although more clearness of statement might be desired, the compensation seems to be attributed to the corresponding centre of the opposite cerebral hemisphere. The electrical irritation indicated that the centre for the upper limb was not sharply defined from that for the lower limb.

Sensory Cerebral Cortex. The experiments of Harvey Cushing² on the sensory cortex of man promise to be of great value. In two cases he applied the electrode directly to the brain without having the patients in an anesthetic state. His statements are that, in both, the situation of the central fissure could be determined by obtaining characteristic motor responses from the precentral gyrus, these motor responses being attended by no sensation other than that of the forced change of position which accompanies similar movements elicited by stimulation of a peripheral nerve.

Stimulation of the postcentral convolution gave definite sensory impressions which were likened, in one case, to a sensation of numbness, and, in the other, to definite tactual impulses. In both of the patients stimulation of the outlying convolutions gave no response either of a subjective sensation or of active movement.

In one of these two cases, he was able to determine by the electrode the region in which sensory epileptic attacks occurred, but no lesion of this

¹ *Monatsschrift f. Psychiatrie und Neurologie*, vol. xxvi, 1909, p. 129.

² *Brain*, vol. xxxii, 1909, p. 4.

part of the cortex was found, although an incision 3.5 cm. in length and 2.5 cm. in depth was made. It is not stated whether this operation in any way arrested the attacks. This knowledge would be important as the focal area was so accurately tested.

A valuable contribution to the function of the parietal lobe has been made recently by Karl Schaffer.¹ He refers to the cases published in the literature, in which a lesion of this lobe was found, and reports a case, with necropsy, in which a careful study was made by him. The supramarginal gyrus was softened in each hemisphere. He concludes that in this gyrus are located the muscular sense, cutaneous sensation, and stereognosis. This gyrus has no corticofugal projection fibers to the optic thalamus, and yet in it are situated the memories of deep and superficial sensation.

Aphasia. In regard to Marie's views on aphasia, a case reported by van Gehuchten² is important. The patient, a woman, was right-handed from birth. She became paralyzed on the right side. Speech was not in the least affected. A large area of softening was found in the left lenticular zone. The case shows that such a lesion, contrary to Marie's opinion, does not necessarily cause aphasia; but it is in evidence neither one way or the other as regards the function of Broca's region.

Barrett's³ well-studied case of "pure" word deafness is worthy of careful consideration. A thorough examination of the patient's speech capacity was obtained and later the brain was studied by serial sections. The examination showed that "pure" word deafness may result from disturbances of the cortex and underlying adjacent fiber regions in parts of the first and second temporal convolutions in both hemispheres.

Barrett has found only 11 similar reported cases.

Abscess of the Brain. Cerebral abscess secondary to bronchiectasis, as in the case reported by Edwin Bramwell,⁴ is uncommon, although, as Bramwell says, the relationship is well known. Virchow was the first observer to recognize the association between abscess of the brain and pulmonary disease, and this was in 1853. According to Rudolf Meyer's statistics, pulmonary disease appears to be only second in importance to traumatism and otitis as a cause of brain abscess. Schorstein has stated that of 3700 autopsies at the Brompton Hospital during 1882 to 1904 inclusive, and of over 10,000 autopsies at the London Hospital from 1894 to 1904, there were only 19 cases of cerebral abscess associated with pulmonary disease.

Bramwell's patient had a visual aura preceding his convulsions, in the form of flashes of light. He compared the sensation to what might be expected if someone standing on the opposite side of the street had from

¹ *Monatsschrift f. Psychiatrie und Neurologie*, January, 1910, p. 53.

² *Semaine Médicale*, February 2, 1910, p. 59.

³ *Journal of Nervous and Mental Disease*, February, 1910, p. 73.

⁴ *Review of Neurology and Psychiatry*, February, 1910, p. 77.

time to time flashed a light from a mirror into his eyes. The flashes occurred at first about every half-minute for an hour to an hour and a half before each fit, gradually becoming more frequent, until immediately before the attack they were almost continuous. As Bramwell says: "Cases are of extreme rarity in which a visual aura was proved by autopsy to be associated with organic diseases of the brain." He concludes that a gross lesion, limited to the second occipital or posterior part of the second temporal convolution, may give rise to visual discharges; and, secondly, that although there appears to be no case on record in which a lesion proved by autopsy to be limited to the angular gyrus produced a visual aura, yet there is strong reason for believing that a lesion so situated may do so.

Hemiplegia. HEMIPLEGIA FROM EMOTION. At first thought it seems improbable that hemiplegia in a young person previously apparently perfectly healthy could develop as a result of emotion, but such cases have been observed by Babinski, Oppenheim, and E. Frank.¹ The latter reports the case of a woman, twenty-six years of age, who became hemiplegic eight days after a severe fright. The heart was normal, and at first no satisfactory cause could be found for the paralysis. The symptoms indicated that the case was organic, and that the lesion was in the pons. Wassermann's test proved to be positive, and careful examination of the entire body revealed small scars near the mouth, attributed to a facial eruption at the age of five years. Corneal opacity had occurred at the age of ten years. The diagnosis of hereditary syphilis was made and the explanation was offered that, as a result of emotion, a diseased syphilitic pontile vessel had ruptured and caused a gradual leaking of blood.

SIDE AFFECTED IN HEMIPLEGIA. As Ernest Jones² says, it has for more than a century been taught that the question of the side affected by a hemiplegia is one of considerable value in the diagnosis of the nature of the affection. It may be questioned, however, whether Jones' statement is quite correct when he says that it is generally held that the fact of a hemiplegia occurring on the right side is presumptive evidence that it is due to either thrombosis or embolism, while the fact of its occurring on the left side is presumptive evidence that it is due to either cerebral hemorrhage or hysteria. Such sharp distinctions would not be accepted by many.

Jones makes a careful study regarding the side affected in hemiplegia, using the hospital records of 154 unpublished cases of cerebral arterial lesions, comprising all the cases of hemiplegia due to such lesions that came to necropsy in University College Hospital, London, from about 1830 to 1900; also a collection from the literature of 3697 cases of cerebral arterial lesion in which a necropsy was obtained. Of these, 2410

¹ Berliner klin. Wochenschrift, June 21, 1909, p. 1154.

² Quarterly Journal of Medicine, April, 1910, p. 233.

were cases of cerebral hemorrhage, 349 of thrombosis, 626 of embolism, and 312 of doubtful nature. In addition, he used 626 clinical cases of hemiplegia observed by himself, a collection of 373 cases of hysterical hemiplegia reported in the literature, and 431 cases of hemiplegia from arterial lesions without necropsy.

His conclusions from a study of this extraordinary material are that in the cases of cerebral hemorrhage, thrombosis or embolism, no evidence was obtained to indicate that either the lesion or the hemiplegia is more likely to affect one side more than the other. The general teaching to the contrary is not founded on any critical evidence. It is unproved that hysterical hemiplegia affects one side more frequently than the other.

HEMIPLEGIA FROM ARTERIAL CLOSURE. It is suggested by William Russell¹ that temporary closure of cerebral arteries may be the cause of transitory hemiplegia; the condition is comparable with intermittent lameness from change in the peripheral arteries. This opinion is not based upon observation of brains removed from hemiplegic persons, but has much in it that appeals to us. It is a local closing, partial or complete, and as a result impairment or complete suspension of function occurs until the vessel opens. It may be a cause of migraine. The transitory closing may, by favoring thrombosis, lead to permanent occlusion of the vessel. The views expressed by Russell do not differ from those of Edgeworth, referred to in my digest of last year.

SOFTENING AS CHIEF CAUSE OF HEMIPLEGIA. Ludlum² has found, by examination of the specimens from 93 cases, that lesions occur as frequently in the distribution of the anterior choroid, the posterior communicating, and the posterior cerebral arteries as in the distribution of the striate group of vessels. In these 93 cases the lesion was softening in 69, and in many cases of hemorrhage it was possible to demonstrate that the initial lesion was softening. All the cases of hemorrhage in the ventricles, eight in number, showed an underlying softening in the basal nuclei, with subsequent erosion through the lining of the ventricle, and then a hemorrhage.

PARTIAL CEREBRAL PALSY. O. Foerster³ has made a very interesting study of paralysis from cerebral lesions. If the lesions be small and in the cortex only, the foot, or foot and leg, may be affected and the thigh escape. Or the fingers alone may be paralyzed and the rest of the upper limb escape. A lesion to produce so limited a paralysis must be very small. A capsular lesion may cause moderate weakness of a small portion of a limb, but never complete paralysis of a small portion with integrity of the rest of the limb. The centres for separate portions of the limbs contain, according to Foerster, centres for individual muscle groups,

¹ *Lancet*, October 16, 1909, p. 1109.

² *Journal of Nervous and Mental Disease*, December, 1909, p. 705.

³ *Deutsche Zeitschrift f. Nervenheilkunde*, vol. xxxvii, Nos. 5 and 6.

so that, for example, the extensors of the hand may be completely paralyzed while the supinators escape. A paralysis of this type could hardly occur from a capsular lesion. Foerster even believes that the centres for muscle groups contain centres for the individual muscles. This view is difficult to accept, as the opinion is widely held that movements and not muscles are represented in the cerebral cortex.

Fabritius¹ believes that a partial lesion of the pyramidal tract in the spinal cord may cause paralysis confined to a segment of a limb. The fibers of the pyramidal tract are not mingled without definite order, but those for the lower limb are contained within the posterior, or posterior and inner part of the pyramidal tract; while those for the upper limb are contained in the outer or outer and anterior portion of this tract. The fibers for the proximal portions of the upper and lower limbs are more interior and posterior in their respective tracts than are those for the distal portions of the limbs.

Almost always, in cortical paralysis of the upper limb, the hand is more affected than the shoulder, and Bonhöffer believes that a cortical lesion never affects the motility of the shoulder and elbow-joints and at the same time spares that of the hand. Bergmark² refers to several cases in which the proximal portion of the upper limb was more affected than the distal portion, and speaks of an interesting case observed by him. The right lower extremity was markedly paretic. There was paresis of the sternomastoid. At the shoulder, the arm could be raised upward only 45 degrees. The range of movement at the right elbow was normal. Both hands were paretic, but especially the right one. At the operation, a tumor was found occupying the posterior central convolution on a level with the centre for the leg. By means of electrical excitation the centres for the muscles of the shoulder and neck were established, and these were found close to the tumor. The tumor was excised. After the operation the right shoulder was dropped and could not be raised. The forearm could be moved, and pronation and supination, as well as movements of the hands and fingers, could be accurately performed. Three months after the operation the upper limbs could be elevated at the shoulder-joint to 45 degrees, the movement of the elbow- and wrist-joints was almost normal. All the movements of the fingers could be performed, though weakly and without precision.

The course after the operation shows obviously, Bergmark thinks, that a process situated immediately above the centre for the shoulder-joint may affect the mobility of this joint more than that of the elbow-joint, and the mobility of the latter joint more than that of the hand. This case also disproves Bonhöffer's doctrine, and shows in the same way as do cases previously reported that a cortical process may cause a marked paresis of more proximal parts of the upper extremity.

¹ *Deutsche Zeitschrift f. Nervenheilkunde*, vol. xxxvii, Nos. 5 and 6.

² *Review of Neurology and Psychiatry*, April 1910, p. 199.

Bergmark reports another case in which the patient recovered the power of complicated and associated movements of the hand, though the function later became somewhat masked by rigidity. At the elbow-joint the paresis improved to a certain degree as regards extension, and completely as regards flexion. The paresis remained most marked in the shoulder-joint. No paresis was found in the lower limb, but, when spasm developed, the proximal and not the distal parts were the seat of the disorder. A few similar cases are referred to.

Bergmark believes that, from a clinical point of view, one may speak of localization in the cortex of the various subcentres for the arm and hand, and, if the hand be implicated, its function need not be impaired as a whole, as several cases of more or less isolated paralysis of the fingers are known; this applies to the coarse power as well as to the isolated movements.

Another important contribution to cerebral monoplegia, especially in reference to sensation and spastic phenomena, is made by Bergmark.¹ In the main, his views are in accord with those generally held, but especially interesting is the conclusion that cortical lesions do not produce definite increase of the reflexes or the typical late contracture found in hemiplegia of capsular origin. On the other hand, early contracture ("Frühcontractur") is a common result of cortical lesions and is due to cortical irritation.

MOVEMENTS OF TONGUE IN HEMIPLEGIA. Beever and Horsley split the tongue of a monkey longitudinally and observed the result of cortical irritation of the tongue centre. Irritation of a certain region of the left hemisphere caused equal projection of both halves of the tongue, so that it was evident that the tongue has a bilateral innervation. Irritation of another region caused extension over the teeth of the half of the tongue on the side corresponding to the irritation, and retraction of the other half of the tongue; the result of both movements together in a normal tongue would be deviation of the tongue and protrusion toward the opposite side.

Auerbach² reports an interesting case which shows that Beever and Horsley are correct in their belief that all movements of the tongue are represented bilaterally in the cortex. A man had a peripheral paralysis of the left hypoglossal nerve from a stab wound in the neck, and right hemiplegia developed within a few days after the injury. When the tongue was extended it deviated markedly toward the left, and as the left hypoglossal nerve was destroyed and communication with the left hemisphere was cut off, the deviation toward the left must have been accomplished by means of the right hemisphere, and the deviation was away from the side of the paralyzed limbs. The case demonstrates for man what Beever and Horsley showed is true of the monkey, viz., that

¹ *Brain*, 1910, vol. xxxii, p. 342.

² *Deutsche Zeitschrift f. Nervenheilkunde*, vol. xxxix, p. 109.

both halves of the tongue are represented in each hemisphere. The power of protrusion of the tongue developed gradually, showing that the vicarious action of the right hemisphere had to be acquired. The movement of the tongue in this case may be capable of other explanation, however.

COATING OF TONGUE IN HEMIPLEGIA. Unilateral coating of the tongue has been the subject of an interesting study by George W. Jacoby.¹ He does not regard it as very rare, and has observed it many times in hemiplegia, in trigeminal neuralgia, once in hysterical hemianesthesia, and once in paresis. In all cases of hemiplegia in which he has noticed unilateral furring, there was also paralytic involvement of this organ to a marked degree. In all his cases of trigeminal neuralgia in which the tongue showed this peculiar furring, the third branch was involved, either alone or in combination with one or both of the other branches, and, in two of these cases, the pain was confined to the tongue and travelled along the border of one side and into the point. In the case of hysterical anesthesia, there was hemianesthesia of the tongue, together with complete anesthesia of the body. The case of paresis also showed hemianesthesia of the tongue with anesthesia of the face, of the arm, and of the mucous membrane of the mouth upon the same side.

Jacoby does not accept the explanation of trophic disorders, although he acknowledges that everyone will be ready to admit the influence of the nervous system in producing alterations in the nutrition of the tongue. He accepts the teaching that the phenomenon is due to the fact that the side of the jaw corresponding to the furred half of the tongue is but little used in mastication, and hence no removal of the epithelium of the tongue takes place by friction upon that side. In all the published cases there has been inhibited motility of the side of the tongue on which the coating has been found.

Encephalitis. Acute ataxia of central origin resulting from diphtheria is very rare. Ataxia from peripheral nerve disorder after diphtheria, diphtheritic pseudotabes, is seen frequently. In the case described by Max Brückner,² a child afflicted with diphtheria, during the second week of illness, presented mild disturbance of intelligence, intense motor and static ataxia without paralysis or sensory disturbances, but with speech defects characterized by monotony, slowness and explosive utterance. Later temporary paralysis of bladder and rectum occurred. Almost complete recovery resulted, but only after several months. The patellar reflexes were at first exaggerated.

Such a clinical picture was first described by Westphal, and later by Leyden, as acute central ataxia. The latter attributed the condition to disseminated encephalomyelitis, implicating especially the pons, cere-

¹ Festschrift z. Vierzigjährigen Stiftungsfeier des Deutschen Hospitals in New York, 1909.

² Berliner klin. Wochenschrift, August 23, 1909, p. 1563.

bellum, and medulla oblongata. As even clinical cases are so rare, the pathology of the disorder is very uncertain.

Chronic External Familial Ophthalmoplegia. This remarkable form of palsy is described by Nazari and Chiarini.¹ It begins usually in infancy or adolescence, more rarely in adult life, affects all the external muscles of the eyes, including the levator palpebræ superioris, and after several years the external muscles become completely paralyzed. The inner eye muscles escape, and with the exception of headache and some somnolence, there are no other nervous symptoms. One of the branches of the oculomotor is usually affected first, but the fourth or the sixth nerve may show the first palsy. Both eyes are implicated simultaneously or one soon after the other. While a fairly large number of cases of progressive external ophthalmoplegia are recorded, the familial form is very rare. The authors have found in addition to two cases of their own in one family, only a series of twelve cases occurring in four generations of the same family and reported by Beaumont.

Defects of Skull with Optic Atrophy. Bertolotti² believes that certain cases of optic nerve atrophy occurring in childhood, apparently without cause, may be produced by bony defects at the base of the skull. *X*-rays have shown him that alteration of the central portion of the sphenoid bone or of a part of the ethmoid bone may be detected in such cases, even when there is no deformity of the external portion of the skull. These basal defects may be of the same character as are seen in oxycephalia.

Meningitis.—The diagnosis of purulent meningitis conveys with it, usually, the idea of fatality. Exceptions of course occur, and in the epidemic form, which also is purulent, Flexner's serum has modified the seriousness of the prognosis. A case has been reported by Shields, Spiller, and Martin³ in which the symptoms indicated a focal lesion of rapid development in the motor region of one cerebral hemisphere. An exposure of the brain revealed purulent meningitis in the upper Rolandic region. The bone flap was replaced, and the child made a complete recovery. Occasionally, a Jacksonian convulsion has occurred since the operation on the side opposite to the lesion. The meningitis followed pansinusitis. This case raises the important question as to whether the mere exposure of the brain may be sufficient to effect a cure in purulent meningitis.

LOCALIZED MENINGITIS. The localized meningitis of the cord has created much interest, and more recently a similar condition of the brain has been described. Raymond and Claude⁴ devote an interesting paper to this subject. In all the cases of localized serous meningitis of the brain, the temperature is elevated and the pulse is more rapid, and the tem-

¹ *Semaine Médicale*, August 11, 1909, p. 382.

² *Revue Neurologique*, February 28, 1910, p. 259.

³ *University of Pennsylvania Medical Bulletin*, December, 1909, p. 298.

⁴ *Semaine Médicale*, December 8, 1909, p. 577.

perature falls after the evacuation of the fluid. There are also signs of cerebral stimulation or cerebral inhibition. The symptoms vary, but resemble those of tumor, meningitis, abscess, etc., and therefore the clinical diagnosis of localized cerebral serous meningitis can hardly be made with certainty. This is much to be regretted, because the condition is amenable to surgical treatment and to nothing else. It is to be hoped that more study will be given to this subject and that the methods of diagnosing may become more reliable.

A further contribution to circumscribed serous meningitis of the brain is made by Oppenheim and Borchardt.¹ The symptoms were those of tumor of the posterior cranial fossa, but a cyst of the meninges beneath the right cerebellar lobe was found, and after evacuation, the cerebral symptoms disappeared, and the patient a year later was still well. Diplopia, paresis of the abducens nerve, and choked disk all disappeared.

Oppenheim remarks that the chronic serous meningitis of the posterior cranial fossa may follow trauma and possibly other causes. Symptoms sharply defining it from cerebellar tumor are wanting, although meningeal irritation, exacerbations, and long remissions are suggestive. Occasionally a murmur like that of an aneurysm may be produced. When mercury and iodide do not relieve the symptoms, operation must be resorted to. Lumbar puncture, even if so small an amount as 2 c.c. be removed, may increase the symptoms.

Syphilitic paralysis of the trigeminal nerve without paralysis of other nerves is uncommon, and when it occurs the lesion may be mistaken for one of tumor. In a case reported by Spiller and Camp,² intense fibrillary contractions were observed in the masseter muscle, and microscopic examination revealed great degeneration of the trigeminal nerve. There was the meningitis common in syphilis.

TREATMENT OF MENINGITIS. Flexner³ states that the excellent results obtained from his *serum* in the treatment of epidemic cerebrospinal meningitis in America and Great Britain are being repeated in France. There have already been published reports covering 100 or more cases of the disease treated with the serum, in which the mortality will probably be less than 25 per cent. A small number of cases thus far reported, treated by other methods, have given a far greater mortality, and one approaching 80 per cent. The total number of reports of cases of epidemic meningitis treated with the serum prepared at the Rockefeller Institute, which Flexner has collected, is under 1000, and he thinks it will take a larger number than that to establish its value. This very modest estimate of the value of his serum is in striking contrast with the remark of Rotch, that from the administration of the serum the

¹ Deutsche med. Wochenschrift, January 13, 1910, p. 57.

² American Journal of the Medical Sciences, March, 1910, p. 402.

³ Journal of the American Medical Association, October 30, 1909, p. 1443.

mortality fell from 80 to 19 per cent. in his wards in the Children's Hospital.

Rowell¹ states that in a case with the symptoms of meningitis in which he employed *hexamethylenamin* in one-grain doses every four hours, the temperature began to fall within twelve hours after beginning the treatment. The spinal rigidity gradually disappeared, and while the erysipelatous process which was present was prolonged, the meningeal symptoms became less apparent daily.

Lumbar puncture has been employed in the treatment as well as in the diagnosis of meningitis. Hultgen² reports 4 cases in which it was of service. He believes that the symptoms of meningitis are identical with those of pressure phenomena, that the infectious toxic factor has been overrated, and the mechanical element neglected, that lumbar puncture is advantageous in the majority of cases, and that tuberculosis of the cerebrospinal meninges owes its danger to the mechanical effects produced by the excessive pressure upon the centres of the medulla oblongata, and not to its infectious character. It is well known, he states, that tuberculosis elsewhere has a remarkable tendency to self-cure.

Puncture of one of the cerebral ventricles has been recommended in the treatment of meningitis, and, when the meningitis is of the epidemic variety, intraventricular injections of Flexner's serum have been employed. A case in which this was tried is reported by Louis Fischer.³ The recovery was without complications. A lumbar puncture yielded 1 c.c. of turbid blood-tinged fluid, in which the meningococcus could not be found. Four attempts made later resulted in dry taps. About 15 c.c. of turbid fluid containing pus were then withdrawn from the right lateral ventricle. Smears made showed intracellular Gram-negative meningococci. The ventricles were irrigated with normal saline solution at a temperature of about 105° F. The excess of fluid was allowed to drain out through the needle, and 25 c.c. of antimeningitis serum were slowly injected into the ventricles. The procedure was repeated the next day. A couple of days later a lumbar puncture performed in the fourth lumbar interspace resulted in a dry tap. A second needle was then inserted in the third interspace, the first needle being allowed to remain *in situ*. Through the second needle, 15 c.c. of Flexner's serum were injected, about 3 c.c. of which returned through the first needle. The infant retained in its spinal canal 20 to 25 c.c. of serum. A better result seemed to be obtained when intraventricular injections were given at the same time with injections into the spinal canal.

Fischer recommends lumbar puncture in the treatment of cerebrospinal meningitis, as soon as distinct meningeal symptoms are noted.

¹ Journal of the American Medical Association, November 13, 1909, p. 1641.

² American Journal of the Medical Sciences, March, 1910, p. 344.

³ Monthly Cyclopedica and Medical Bulletin, March, 1910, p. 129.

Flexner serum should then be injected, if possible, the quantity of serum should equal, but never exceed, the quantity drained from the spinal canal. If the lumbar puncture yields a dry tap and meningeal symptoms continue, aspiration of the lateral ventricles should be done, if in an infant, through the anterior fontanelle; and if in an older child, by the method known as the Kocher method, entering the skull by means of incision, and then injecting the antimeningitis serum directly into the ventricle.

A small patch of scalp is shaved and a short 1-inch linear incision made about 3.5 c. from the mid-longitudinal line and about 5 c. anterior to the sulcus centralis; the bone is exposed and penetrated by a Doyen perforator followed by a burr, which leaves a cup-shaped fossa and gives sufficient exposure to the dura to assure the operator that there is no large underlying cortical vessel. The hollow exploratory needle, which should have a blunt point with openings upon the sides, is then gently inserted into the second frontal convolution, perpendicular to its surface, and at a depth of from 4 to 5 c. readily finds the ventricle, particularly if it is distended. Ventricular puncture should be repeated daily, according to Fischer, until the tapping yields a negative result.

The infant in whom this treatment was followed, was discharged in normal condition.

Flexner, in the discussion of this case, said it was the first example of recovery in epidemic cerebrospinal meningitis in which there was an impassable obstruction at the foramen of Majendie, and in which a purulent exudate had been proved to be present in the ventricles. There have been several instances in which the ventricles have been tapped and serum injected, but Fischer's case is the first to terminate in complete recovery. Flexner referred to 3 operated cases, with death.

I have given the details of this report because the subject is of much practical importance. In purulent meningitis desperate measures are necessary, but I cannot refrain from asking what must be the condition of the very soft brain of a young child after a daily puncture of the ventricle has been performed? Have any thorough examinations of brains treated in this way been made soon after the injections or at a later date? Is there not danger of intracerebral hemorrhage from injury of a small vessel? These are considerations that would make ventricular puncture advisable only in very serious cases.

DISEASES OF THE SPINAL CORD.

Tabes. RELATION OF SYPHILIS. Mott's¹ investigations on syphilis of the nervous system have been very valuable. In a recent paper he states that he has usually found the whole cerebrospinal system affected,

¹ Proceedings of the Royal Society of Medicine, February, 1910.

although, in some cases, the spinal symptoms are the more obtrusive, and in others, the cerebral. He relates a case which seems to be a reliable instance of reinfection. The researches of Ravaut and others show the frequent existence of a lymphocytosis during the secondary period, sometimes very abundant, which proves there may be a meningeal reaction concomitant to the cutaneous eruption. Mott refers to an interesting case in which it appears probable that an infection of the spinal meninges occurred at the time of the secondary eruption, that it remained latent under the influence of mercury, and that, owing to a temporary injury caused by a fall, the virus was able to decrease the resistance of the tissues and set up active proliferation a week after the fall. If once the virus has obtained access to the cerebrospinal fluid, it is difficult to dislodge. Under mercurial treatment, as cases show, the most remarkable results may be obtained in the relief of symptoms; patients may be completely cured and no remission occur. Mott is not so hopeful about the cure of brain syphilis as he was when he finished an investigation some ten years ago on 40 cases of cerebral syphilis. He has found that not a few of these patients are dead or have had serious relapses. Brain syphilis is certainly more serious, he thinks, than spinal syphilis.

The normal cerebrospinal fluid contains very few cellular elements, whereas in progressive parasyphilitic and syphilitic meningitic affections the lymphocytes are greatly increased in numbers. The amount of lymphocytosis is an index of the activity of the disease; it can also be used as an indication of the effect of antisiphilitic treatment. Lymphocytosis in tabes and general paralysis does not diminish with anti-syphilitic treatment; it occurs in other affections in which syphilis and even meningitis play no part, but it is strong presumptive evidence of syphilis. It is very valuable in deciding between early doubtful paresis and other conditions, as neurasthenia and alcoholism.

Mott has found that the Wassermann reaction was positive with the cerebrospinal fluid in 92.1 per cent. in 64 cases of paresis. In 21 of these cases, a necropsy has been obtained and the diagnosis of paresis confirmed. In 17 out of the 21 cases which were verified by postmortem investigation, the cerebrospinal fluid was examined during life, and showed an excess of lymphocytes, together with a positive Wassermann reaction. He states that for all practical purposes the Argyll-Robertson pupil is only met with in parasyphilis.

GASTRIC CRISES. It seems peculiar at first thought to cut posterior roots for the cure of gastric crises, especially as crises often disappear as the tabes progresses, possibly because the degeneration of the diseased posterior roots of the lower thoracic region becomes complete. Bruns and Sauerbruch,¹ however, report a case of tabes in which gastric crises

¹ Mitteilungen aus den Grenzgebieten der Medizin und Chirurgie, vol. xxi, No. 1, p. 173.

had lasted about nine years, and in which they brought relief by cutting posterior roots. The patient had lost much flesh, 58 pounds within two years. The seventh, eighth, and ninth posterior thoracic roots on each side were divided. Crises did not occur after the operation, and as the patient could eat what he desired he soon regained most of the flesh he had lost. A zone of anesthesia for touch and pain was present from the lower third of the sternum to the umbilicus. Temperature sensation was nearly normal in this zone. An attack which occurred after the operation was attributed to drinking sour milk.

The first operation of this kind for the relief of gastric crises seems to have been done by Küttner.

Mingazzini¹ proposed resection of the posterior roots for the severe pains of tabes eleven years ago, but only in cases in which the pains are persistent and cannot be controlled by drugs. His proposal was not favorably received. He has therefore no results to report, but the treatment is worthy of trial.

TABETIC ULCERS. Richard Levy² found disease of the neighboring joints and bones in 12 cases with 14 tabetic ulcers that he studied, and in all except 1 case these alterations were of the character of typical arthropathies. He regards the arthropathy as primary, the mal perforant (tabetic) ulcer as a result. Mechanical insults merely predispose to the formation of ulcers, but are not a primary cause. He advises an x-ray examination of the foot in every case in which a tabetic ulcer appears, although surgery could be of use only by the removal of the diseased bone. One may well hesitate to resort to this form of surgery.

ANESTHESIA OF THE EYEBALL TO PRESSURE is described by Haenel³ as a new sign of tabes. Diminution of sensation to pressure in the testicle, epigastrium and trachea has been observed in tabes. Slight pressure on the eyeball toward the floor of the orbit with the finger is painful in a healthy person, and the pain resembles that produced by pressure on the testicle. The results obtained by operation on the trigeminal nerve seem to indicate that the sensation of pressure in the eyeball does not depend upon this nerve; rather, it would seem to depend upon the cervical sympathetic. Haenel believes the sign may be especially valuable in early tabes when the indications are not numerous.

General Paralysis.—As regards the probability of general paralysis having its origin in bacilli, J. P. Candler,⁴ from his investigations, comes to the following conclusions: General paralytics are liable to secondary infections and complications, and it is possible that diphtheroid bacilli may play some part in these secondary infections. The use of an anti-

¹ *Neurologisches Centralblatt*, April 16, 1910, p. 406.

² *Mitteilungen aus den Grenzgebieten der Medizin und Chirurgie*, vol. xxi, No. 1, p. 85.

³ *Neurologisches Centralblatt*, May 1, 1910, p. 459.

⁴ *Archives of Neurology and Psychiatry*, 1909, vol. iv.

serum prepared from such bacilli may be attended with transitory beneficial effects. The assumption, however, that a particular group or groups of diphtheroid organisms act as the specific factor in the production of general paralysis is unwarranted, and has not yet been substantiated by any published research.

Spinal Tumor. Oppenheim's¹ experience in tumors of the spinal cord has been remarkable. He finds it often difficult or impossible to diagnose between tumors of the vertebræ and tumors of the meninges. Rigidity, impairment of motion, and tenderness upon pressure may not be detected even when the tumor is in the vertebræ. Extradural tumors sometimes cause dulness on percussion. The Röntgen rays may be of service in tumors of the vertebræ, but may fail. A tumor may begin in the meninges, but implicate the cord by growing into it. Oppenheim has been unusually fortunate in having cases which caused him little or no hesitation in diagnosis between extramedullary tumor and degenerative processes of the spinal cord. Nonne has found more difficulty in this respect, and I also have had cases in which a differential diagnosis seemed impossible for a time. One must be very careful, according to Oppenheim, in employing loss of the abdominal reflex in localization of a tumor, as it may be found with tumors in different levels of the spinal cord.

Oppenheim has had 25 cases of spinal tumor with successful operation in 13, *i. e.*, the tumor was found at the operation, was entirely removed, and the patient recovered at least so far that he could walk. What seemed to have been complete recovery occurred in 9 or 10 cases. Death followed operation in 8 cases. The tumors in the successful cases were situated in 6, in the thoracic region; in 4, in the cervical region; in 1, in the lumbar region; and in 2, in the cauda equina.

Pearce Bailey² speaks of some unusual symptoms of spinal tumor. Tumors in the upper part of the spinal axis have been associated with choked disks and symptoms referable to the midbrain and cortex, and autopsies have shown that the cranial nerve palsies, the delirious mental states, the headaches, the epileptic convulsions, etc., do not necessarily owe their existence to metastases from the spinal tumor nor from any destructive lesion whatsoever. Such cases are explained on the assumption of internal hydrocephalus, and, in some instances, hydrocephalus has been found. Fracture of the cervical vertebræ has caused choked disk. In a case reported by Taylor and Collier, a spicule of bone was found compressing the cord, and when the spicule was removed, the choked disk of five diopeters rapidly receded. These authors found no case in which choked disk occurred when the lesion was below the third thoracic segment. Bailey also discusses the circumscribed serous spinal meningitis, which has now become a well-recognized lesion,

¹ Deutsche med. Wochenschrift, 1909, No. 44.

² Medical Record, March 12, 1910.

An interesting vasomotor symptom is edema, chiefly in the lower limbs, in tumors of the lower segments of the cord and in cauda equina lesions. It has the characteristics of edema due to kidney disease, but is distinguished from it by the urine being normal. This edema may be very great, and it is not always possible to be certain that it is not the result of blocked venous return, although no such cause is necessary. Tumor without pain is also considered by Bailey.

While typical cases of spinal tumors are easy of diagnosis, I suppose everyone who has had much experience with organic nervous diseases will recall cases in which he suspected that a tumor of the spinal cord might be present and yet felt very uncertain concerning the diagnosis. As Pearce Bailey¹ says: "The diagnostic consideration which outweighs all others in importance is the fact that a spinal-cord tumor may masquerade under the guise of any one of the several chronic spinal diseases. The question used to be, 'Are we sure an operable tumor is present.' It is now, in every case of paraplegia coming on without known cause, 'Are we sure a tumor is not present.'"

Bailey believes that the loss of much cerebrospinal fluid is an important cause of death in operation for spinal tumor, and that operative technique is the best by which little or no fluid is lost. The avoidance of this danger is easy by having the patients operated upon in the Trendelenburg position, or at least on a table tilted head downward. The leakage of cerebrospinal fluid after the operation, which has been the assigned cause of meningitis in certain cases, should never occur, and is easily avoided by careful suturing.

The onset of the symptoms is usually gradual, but may be acute, a sudden pain or paresthesia may initiate the symptoms.

It seems strange that the mortality should be so high. In 26 operations reported by F. Krause, 8 patients died as an immediate consequence of the operation. This high mortality Bailey thinks is caused in part at least by the poor resistance of the patients. Laminectomy for other conditions is not followed by any such death rate. The danger may be in part avoided by early operation.

Spastic Family Paralysis.—Although a few cases of spastic family paralysis with necropsy have been recorded, the pathology of this disorder is by no means fully understood. In cases which have been examined microscopically, lesions have been found. It is, therefore, with much surprise that we read in the report of an examination by Raymond and Rose² that nothing pathological was found. The clinical history of the case was published in 1896. The patient had been under observation from 1895 until 1908. She began to have progressive spastic paraplegia at the age of twelve years, with club feet, the signs of Babinski, Oppenheim, and Strümpell, and without disturbance of sensation or of the

¹ Journal of the American Medical Association, March 12, 1910, p. 849.

² Revue Neurologique, June 30, 1909, p. 781.

sphincters. A sister showed similar symptoms at the age of nine years and presented a more serious type of the disease. The microscopic examination of the first case was entirely negative, and neither hysteria nor diminution in size of the fibers of the pyramidal tracts could be accepted in explanation. The case at present is inexplicable.

Sicard, in the discussion, stated that he and Raymond had reported a case of fracture of the lamina of the twelfth thoracic vertebra with spastic paraplegia, contractures, clonus and Babinski sign, lasting six months. Operation revealed compression of the cord by a piece of bone. The symptoms disappeared rapidly and the patient recovered completely. From this it is argued that the pyramidal tracts were not degenerated, notwithstanding the long duration of the contractures and spasticity.

Punton¹ has observed 7 cases of this rare disorder occurring in two families. In one family, the mother developed the symptoms (weakness and spasticity) after marriage. Her eldest son manifested the first signs at the age of sixteen years. Another son began to be clumsy in walking at the age of fifteen years, and gradually spastic paraplegia developed. Another son became affected at the age of fourteen or fifteen years.

In the second family, the mother and two of her children had the disease. The onset in the mother was uncertain, but after the age of thirty years the symptoms gradually became pronounced. A daughter was affected at the age of six years, and another daughter, when examined at the age of five and a half years, was distinctly spastic in the lower limbs.

Treatment of Spasticity. The treatment of spasticity in the method devised by Schwab and Allison² is named by them *muscle-group isolation*. This implies the isolation of the muscle or group of muscles which are at fault in the production of contracture, deformity, or athetosis. It is made effective by cutting off from the central nervous system the connection along which the abnormal impulses, active in causing spasticity, or athetosis, are transmitted. This is done by direct attack upon the nerve itself, by isolating it, and injecting it with an alcoholic solution. There has resulted an immediate paralysis of the physiologically stronger group of muscles without interfering with the free muscular use of the antagonists.

Several papers have appeared on the treatment of spasticity by resection of the posterior spinal roots, since my previous reference to this subject in *PROGRESSIVE MEDICINE*.

Progressive Spinal Muscular Atrophy. Syphilis may cause muscular atrophy in association with other symptoms, especially sensory disturbances; but without other symptoms, as in a case reported by Pierre

¹ Journal of Nervous and Mental Disease, October 1909, p. 588.

² Ibid., August, 1909, p. 449.

Merle,¹ atrophy is very uncommon. In Merle's case, all four limbs were affected and the wasting began in the upper and lower limbs about the same time, and was of the type of progressive spinal muscular atrophy. The microscopic examination showed complete disappearance of many anterior horn cells and intense alteration of others. Slight sclerosis of the cord and pia was detected, with cellular infiltration of the pia, but very little perivascular cellular infiltration of the cord.

An interesting case in which a fall was followed within a few weeks by progressive spinal muscular atrophy is reported by Hellbach.² All four limbs gradually became affected, and bulbar symptoms appeared. Sensation was not altered, and the reflexes, after a temporary exaggeration, became normal. Degenerated nerve cells were found in the anterior horns of the spinal cord, and in certain motor nuclei of cranial nerves. The pyramidal tracts were not intact. The case is important because progressive spinal muscular atrophy with necropsy is rare, and because of its commencement very shortly after a trauma. In what way the trauma was related to the spinal disease, the author is unable to determine with any positiveness.

Poliomyelitis. The report of the collective investigation committee on the New York epidemic of poliomyelitis of 1907 is a very valuable contribution to neurology.³ The work has been done with thoroughness. This epidemic centred in New York City where some 2500 cases of the disease occurred. It spread rapidly along ordinary routes of travel, and appeared in Boston and other points in Massachusetts. In New York City an unusual proportion of cases occurred on the east side of Manhattan Borough, and the reason for this is not known. It was impossible to discover any susceptibility to the disease according to nativity, in the cases reported. The few cases (2 out of 750) among negroes is remarkable. An unusually large proportion of cases occurred in young children. In the city, the epidemic began in June, and reached its height in September, the onsets of the country cases were generally somewhat later, and the proportion developing in September greater than in the city cases. The disease was moderately communicable; about as much so as epidemic cerebrospinal meningitis. The path of infection could not be determined.

As for the symptomatology in this large series of cases, the reader must be referred to the original report. While the committee do not doubt the rare occurrence of the cerebral type of poliomyelitis, no undoubted case of this form was reported. The cases previously reported by Möbius, Pasteur, Bucelli, and the doubtful cases of Hoffmann and Strümpell are the only cases, in the opinion of the committee, that offer

¹ *Revue Neurologique*, July 30, 1909, p. 877.

² *Deutsche Zeitschrift f. Nervenheilkunde*, vol. xxxvii, Nos. 3 and 4, p. 321.

³ Report of the Collective Investigation Committee on the New York Epidemic of 1907. *Nervous and Mental Disease Monograph Series*.

any support to Strümpell's views of polioencephalitis, and yet Strauss states that, in his examinations, the virus was in the brain as well as in the cord.

Hoffmann¹ found *unilateral facial palsy* in 6 cases of acute poliomyelitis, and in all these the entire distribution of the facial nerve was paralyzed. He observed paralysis of other cranial nerves, as those of the tongue, of deglutition, of the eyeballs, etc. He also observed pronounced fibrillary contractions in paralyzed muscles. Other rare phenomena in poliomyelitis are referred to by him in this article.

Anterior poliomyelitis has occurred recently in epidemic form in Breslau, Germany. Foerster² has made some interesting clinical observations. Lesions have been found in all parts of the brain, even in the optic tracts, as well as in the spinal cord. Stiffness of the neck and pain in the neck muscles have been observed as meningeal symptoms. The symptoms in one case recorded by Foerster were misleading. The child two days after a fall had rigidity and paralysis of the right upper limb, Babinski's sign on the right side, also headache and disturbance of speech. The diagnosis of extradural hemorrhage was made and operation was advised. The tonic and Babinski's sign soon disappeared, flaccid paralysis of the left upper limb developed, and the diagnosis of poliomyelitis was made. Foerster has had ankle clonus in 2 of his cases. In addition to the case referred to above, in which the cerebrum seemed to be implicated, he speaks of a case in which he diagnosticated a lesion in each centre for the lower limb. Cerebral cases are interesting, as they have not been observed in some epidemics elsewhere. Recurrences are not uncommon in poliomyelitis.

EXPERIMENTAL POLIOMYELITIS. The successful inoculation of monkeys with material from poliomyelitis by Landsteiner and Popper, and Knoepfelmacher has been followed by the work of Flexner and Lewis.³ Their description is based upon a study of 81 monkeys which became infected with the virus. The incubation period, *i. e.*, the period between the time of inoculation and the appearance of the first definite paralysis, has varied from four days to thirty-three days, but the average has been 9.82 days. The inoculations were made into the brain through a small trephine opening. The monkeys appear normal until six to forty-eight hours before the onset of paralysis. The animals then become nervous and excitable; on being disturbed and made to move about the cages, they tire quickly; a tremor of the head, face, or limbs develops; when the attention can be attracted, the gaze is shifting, rather than fixed, as in the normal monkey, and the face is wrinkled. All these symptoms are seldom noted in any one animal. The paralysis develops suddenly, and usually extends rapidly to other muscle groups, and is flaccid. The

¹ Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxviii, Nos. 1 and 2, p. 146.

² Berliner klin. Wochenschrift, December 6, 1909, p. 2180.

³ Journal of Experimental Medicine, March 14, 1910.

affected monkeys may recover, but in 54.3 per cent. the issue would in all probability have been fatal. Hence the experimental disease is more highly fatal than is the spontaneous disease in human beings. The nervous tissues resembled closely those obtained from fatal cases of this disease in man. The intracerebral mode of infection is not the only successful one. The parasite has not been discovered, but it is very minute. This entire paper is of great importance in the study of poliomyelitis, and marks an epoch.

Thrombosis of the Cervical Anterior Median Spinal Artery. Thrombosis of the vessels of the spinal cord is a diagnosis which should be made more frequently, for while non-traumatic hemorrhage is rare, thrombosis is of frequent occurrence. With the exception of a case reported by Spiller,¹ there seems to be no demonstration by necropsy of thrombosis confined to a small portion of the anterior cervical supply of the cord.

The patient studied by Spiller experienced pain between the shoulders fifteen or twenty minutes after heavy lifting, and rapidly became weak in the upper and lower limbs. He recovered the power in the lower limbs in large measure. When death occurred, nearly three years later, a degenerated area was found, confined to the anterior part of the cord, and extending from the first thoracic segment to the fourth cervical segment, inclusive.

Friedreich's Ataxia. Jumentié and Chenet² have observed diminished sensation of touch and pain in the posterior part of the upper limbs and shoulders, and in the anterior part of the thighs and legs in a case of Friedreich's ataxia. There was also some disturbance of bone sensation. Dejerine, from whose clinic the case was reported, stated that he had never seen previously these sensory disturbances in this disease.

Fracture of Vertebrae. The case of dislocation of the spine between the atlas and the axis, with probable fracture of the odontoid process, reported by Wallace and Bruce,³ is truly remarkable as regards its mode of occurrence, its clinical history, and the results of reduction undertaken five months after the original accident, when the patient was in extreme danger from pressure upon the medulla oblongata.

The patient, a man, turned his head quickly, and in doing so felt his neck give a little "crick." At the moment there was no pain or other inconvenience. Shortly afterward he felt a lump in the back of his neck, and when he attempted to stoop, he found his head was fixed, and that the attempt to move it forward was very painful. He could not move his head to either side, but could move it slightly forwards. He could use his arms and legs well. A physician diagnosticated rheumatism of the neck. He remained on a ship for two months after the accident, without working. He now had considerable pain in the back

¹ *Journal of Nervous and Mental Disease*, October, 1909, p. 601.

² *Revue Neurologique*, July 30, 1909, p. 944.

³ *Review of Neurology and Psychiatry*, January, 1910, p. 1.

of the head, probably in the distribution of the great occipital nerves. He had pain in the left shoulder and in the calf of the leg. The x-rays showed a dislocation of the upper part of the spine, between the axis and atlas. The atlas had slipped forward on the axis, and it was also inclined obliquely. The displacement was so great that it is difficult to understand how the cord could have escaped compression.

A little over five months after the accident the patient's small son, in play, caught hold of a shawl about his father's shoulders and tried to pull it away. In doing so, he apparently jerked the neck sideways. This caused a sudden severe pain in the neck. The patient was unable to lie down in bed that night on account of the pain in the back of the head. The following day he felt some weakness of the fingers of both hands, and this weakness gradually spread up the arms and down the legs. Retention of urine developed, the limbs became almost completely paralyzed. The diaphragm was paralyzed. The patient's condition became so critical that it was decided that he had not many hours to live unless he could be relieved by reduction of the dislocation. He was raised slightly in bed, and a long towel was placed behind the lower part of his neck and used to make traction upon it in a forward direction. The operator stood behind the top of the bed and placed his hands below the jaws, making firm traction upward and backward. Almost immediately the head was felt to slip into place, and at the same time the lump disappeared. The patient felt greatly relieved almost immediately after the replacement, and the diaphragm resumed its functions. The recovery was gradual and almost perfect.

The authors refer to the fact that fracture of the odontoid process is of relatively frequent occurrence in injuries of the upper cervical spine, associated with dislocation between its first two vertebræ, but in the majority of cases the immediate cause has been some severe injury. The site of the fracture is usually at the base of the odontoid process, where there is probably a *locus minoris resistentiæ*, owing to the persistence of a plate of cartilage, and, in the case reported, this cartilage probably remained unossified.

DISEASES OF THE NERVES.

Paralysis from Cervical Rib. A peculiar form of temporary partial palsy in the upper limb depending upon cervical rib, is described by Osler.¹ In a recent case, a pulsation above the clavicle was noticed on each side, was more marked on the left, and aneurysm seemed possible. More recently, after using the left arm for a short time, the woman experienced a sensation of numbness, sometimes of "pins and needles," and, if she continued to work, the skin got red and the arm felt swollen

¹ American Journal of the Medical Sciences, April, 1910, p. 469.

and hot, then in a little while she was unable to use the arm and even dropped articles from the hand. The condition had gradually increased. When she was quiet and at rest the arm felt natural, and she was able to do ordinary work with her fingers. There was no wasting of the muscles of the hand, and sensation was perfect. An *x*-ray picture showed a well-marked cervical rib on each side, curiously enough, the larger one on the right side.

Osler reported a similar case in 1888. A carpenter, after using the right arm for more than a few minutes, felt an unpleasant sensation, numbness, and great tenderness in the limb, the color of the skin changed, and the whole arm became congested and swollen. The condition at that time could not be explained and *x*-rays had not come into use. Osler observed still another similar case.

As Osler says, the condition resembles intermittent claudication. In many cases of cervical rib, the subclavian artery has been compressed in the angle between the rib and the scalenus anticus. When at rest, and with very slight muscular effort, enough blood reaches the limb, but the demand for more blood which follows exertion is not met, and there is stiffness and numbness, with vascular changes. So marked may these latter be, that there are cases reported suggesting Raynaud's disease, and local gangrene has occurred.

A diagram given by Keen and reproduced by Osler explains the mechanism of the peculiar disturbance described by the latter.

Multiple Neuritis. Alfred Reginald Allen¹ has made an interesting study of multiple neuritis, devoting his attention to some of the rarer manifestations of this disease. In one case the symptoms suggested tabes, and even a perfectly developed Argyll-Robertson pupil was found. The microscopic examination revealed multiple neuritis. He found the Argyll-Robertson pupil in 3 cases of multiple neuritis, and in these were many swollen axis cylinders in the oculomotor nerves. He found occasional axis cylinders of large size in oculomotor nerves, supposed to be normal, but they were not the same as in the cases with Argyll-Robertson pupils; therefore the swelling of the axis cylinders in the oculomotor nerves may have some causal relation to the pupillary phenomenon.

In 4 cases, a rapidity of the pulse made a vagus lesion probable. The pulse varied between 110 and 140. Swollen axis cylinders were found in the crossed pyramidal tracts in 5 cases, and, in 1 case, the cells of the motor cortex were affected.

Incontinence of urine was present in 2 cases, and delayed urination in 1 case. Allen describes the involuntary twitching or jumping of entire muscles in one case. These involuntary movements are much more common in spinal-cord affections than in multiple neuritis.

¹ University of Pennsylvania Medical Bulletin, November, 1909, p. 262.

This paper has importance because it is a careful, critical study of 17 cases of multiple neuritis, most of them with necropsy.

In reporting a case of multiple neuritis, Herzog¹ describes *degeneration of the posterior columns of the spinal cord and of the direct cerebellar tracts*. He refers to similar cases in the literature, and concludes that poisons or toxins may produce primary systemic degeneration in functionally related neurons. The degeneration sometimes affects only the peripheral neurons, and sometimes only the central neurons, depending upon the character of the poison, and probably on the individual tendencies of the nervous system. Thus there may be polyneuritis or systemic disease of the cord, or both together, and when the latter occurs, the central disease may be masked in its symptomatology by the peripheral disease.

It seems to me that one may get an erroneous impression from this paper, and may be led to believe that central disease is frequently associated with multiple neuritis. After an examination of many cases of polyneuritis, I must state that, in my experience, the microscope usually reveals no very pronounced degeneration of the spinal cord beyond the reaction at distance in the cells of the anterior horns.

Facial Palsy. About two years ago Schlesinger described horizontal vibrations of the eyeballs when the lids were closed. Clark and Tyson² report 3 cases in which this curious phenomenon was observed. They state that it occurs in some types of traumatic and rheumatic palsies of the facial nerve when the orbicularis palpebrarum is greatly involved. The sign is brought out only on attempt to close the lids, and the eyeballs begin see-saw oscillations of from forty to sixty vibrations a minute. They may be partly under the control of the will at times. As no necropsy has been obtained in any case in which this sign was present, all explanation is purely theoretical.

Hirschfeld³ calls attention to the occasional *narrowing of the palpebral fissure* on the side of facial palsy, and explains it as a result of the drooping of the frontalis muscle when it is also paralyzed. He describes clonic movements in the sound side of the face of tic-like character in the early stage of facial palsy, lasting only a few days. This peculiar phenomenon he explains as a result of bilateral innervation of each side of the face, but when one side becomes paralyzed an excess of innervation passes into the sound side. After a few days readjustment occurs.

Baudoin and Chabrol,⁴ in describing *facial diplegia* occurring as a part of polyneuritis, mention that this phenomenon is rare. Laurans has reported 18 cases of this character, to which should be added a case observed by Popoff, 1 by Marinesco, and the one of Baudoin and

¹ Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxvii, Nos. 1 and 2, p. 122.

² Medical Record, January 1, 1910.

³ Berliner klin. Wochenschrift, June 7, 1909, p. 1071.

⁴ Revue Neurologique, January 30, 1910, p. 124.

Chabrol, making 21. The limbs have usually been affected first, and the paralysis of the face has developed from four to twenty-one days after that of the limbs. The facial paralysis may be bilateral from the beginning. Only one of the 21 cases resulted fatally. The cause has not been determined in most of the cases, although suspicion points toward syphilis.

Sensory Fibers in the Facial Nerve. Mills¹ is unwilling to attribute sensory fibers, other than those of a special sense, taste, to the facial nerve. He depends largely for his conclusions upon cases examined by him, in which a part or the whole of the trigeminal nerve was deprived of function by operation, and upon cases of peripheral facial palsy. He quotes Dana as having found absolute loss of all forms of sensation in the distribution of a branch of the trigeminal nerve after this nerve had been cut, and as having observed no loss of deep sensation or of sense of position in complete paralysis of the facial nerve.

It would be difficult to test accurately for deep sensation in any case in which cutaneous sensation was preserved, because a patient would not be likely to distinguish carefully between pressure sensation, especially if slight, and cutaneous sensation. The preservation of pressure sense in lesion of the fifth nerve, as I have observed in tumor of the Gasserian ganglion when epicritic and protopathic sensations are lost, is remarkable, and one does not do justice to the state of affairs by dismissing the subject with the explanation that certain fibers must have escaped. Why are the fibers conveying pressure sense those alone that apparently escape. If in one case one form of sensation were preserved, and in a second case another form, one might assume that the partial preservation of sensation is the result of persistence of some fibers in the trigeminal nerve. I have observed 2 or 3 cases of tumor of the trigeminal nerve, and other similar cases are recorded in the literature, in which it was difficult, from gross and microscopic examination, to believe that any fibers escaped, and yet pressure sense had shown a strange persistency. One should not consider the findings in cases of slow destruction of the trigeminal nerve, as from tumor, exactly of the same value as those from acute destruction of the nerve, as by operation. In the former, time for adjustment has been given. Cases of long-standing anesthesia from trigeminal operation are of much more value in determining the existence of pressure sense in the facial nerve than are acute cases. Mills' results are not in harmony with those of Ivy and Johnson, which were obtained under my directions, but Mills has not given the findings in any case of tumor of the Gasserian ganglion, and his cases of trigeminal resection were acute. The discrepancy in the findings possibly may have this explanation.

Mills agrees with Cushing that much of the postural asymmetry

¹ Journal of Nervous and Mental Disease, May and June, 1910.

observed in the tongue, soft palate, and face is to be ascribed, in section of the trigeminal nerve, to implication of the motor branch of this nerve, which is always divided when the third division of the nerve is divided; it is to be ascribed also, in part, to injury of the facial nerve in peripheral operations.

It is possible, as Mills suggests, that, if the afferent fibers concerned with the sense of pressure and of position and passive movement pass with the motor facial in the periphery, they may, upon entering the cranium, diverge and join the sensory branches of the trigeminus before reaching the Gasserian ganglion, but this does not explain preservation of pressure sense when the ganglion apparently is entirely destroyed by tumor.

Mills believes that the afferent systems for epicritic and protopathic sensibility are not represented in the seventh nerve, even for the limited distribution described by Hunt. Whatever sensory functions the facial may have he believes are of a special sense, that of taste. Limited inflammation of the geniculate ganglion may, in rare cases, occur, producing a syndrome whose factors are loss or perversion of taste and vasodilator and secretory phenomena. If the geniculate ganglion be the seat of inflammation, adjoining parts, such as the facial nerve proper, and the eighth nerve, may be involved by pressure or extension, thus giving rise to peripheral facial paralysis, acoustic phenomena, and phenomena of equilibration and of orientation, vasodilator and secretory symptoms, or to some of these symptoms. The cases of herpetic inflammation—cervico-occipital, auricular and facial—which have been observed in connection with facial paralysis, or facial paralysis and acoustic symptoms, are best explained on the supposition of an involvement of ganglia other than the geniculate.

Tic Douloureux. Patrick¹ has been the earnest advocate of the *alcoholic injections* for the treatment of this serious affection. In his recent paper, he states that whenever the injection has reached the nerve the pain has stopped at once, but there is always an uncertainty of reaching the nerve on any given trial. If the patient is willing to persevere, he is certain of obtaining relief. In many cases, success follows the first treatment. The danger of operation is as nearly nil as can well be. Patrick knows of no fatality, or of a single case of infection. He has had none in over 300 injections. Disagreeable complications are exceedingly infrequent, and have occurred in only 3 of his cases. In a few cases, injection of the middle branch has caused a small hematoma which did no harm, and occasionally he has produced transient paresis of the sixth nerve. In the 75 consecutive cases reported in his last paper, 36 patients were between sixty and seventy years of age, 13 between seventy and eighty, and 1 over eighty. The procedure is not excessively painful, and an

¹ Journal of the American Medical Association, December 11, 1909, p. 1987.

anesthetic is very rarely necessary. He has given gas in 4 cases, but in only 1 was it required. There is no shock. Most of his injections were done in his office and in a few minutes the patients were ready to leave, though it is better for them to lie down for twenty or thirty minutes. The alcohol causes no pain after a few seconds. The injections do not produce a radical cure, and the period of relief is hard to estimate. A good injection may be expected to relieve for from one to three years, possibly longer. Reinjections are as successful as primary injections. Patrick believes that in the majority of cases it is the simplest, least hazardous, and best treatment.

If the method of *electrical treatment* for tic douloureux proves to be as efficacious in other cases as it seems to be in 3 cases reported by V. Vitek,¹ it will be valuable. He applied the anode of the galvanic current to the inner side of the mouth, over the infra-orbital foramen, and on the inner side of the lower jaw near its articulation, where the nervus mandibularis is associated with the nervus lingualis before it enters the canal. He applied a strength of 1 to 1.5 ma. for five minutes over these points, and then stroked the electrode over the entire mucous membrane of the mouth, but did not break the current. The result was surprising, as great improvement occurred within three days in one case. Vitek believes that the nerves may be more readily reached from the interior of the mouth.

Diphtheritic Neuritis. Coulter² states that he has been unable to find mention of a case of second attack of general post-diphtheritic paralysis in the literature, and reports a case of this character. His patient, during an interval of two years, enjoyed good health, one attack of paralysis at least was preceded by undoubted diphtheria, and probably both were. Repeated diphtheritic infection in the same individual is well authenticated, and that one attack only provides immunity for a limited period is well understood. Coulter refers to the fact that the exact duration of the immunity following an attack of diphtheria seems to differ in different persons.

His patient began to have difficulty in swallowing liquids about one week after apparent recovery from diphtheria. Gradually, weakness of the limbs became pronounced and he had symptoms of neuritis of all four limbs. About two years after the first attack he had sore throat, lasting a week or ten days. During this time he had headache, backache, and fever, and was confined to his bed and room for two weeks. About two weeks later weakness began in all four limbs, and signs of multiple neuritis returned. He also had difficulty in swallowing, fluids regurgitating through the nose. He had impairment of vision for about one week. He made a complete recovery from the second attack.

Coulter states that in his patient the amount of residual antitoxin

¹ Neurologisches Centralblatt, July 16, 1909, p. 753.

² Journal of Nervous and Mental Disease, June, 1909, p. 351.

after the first attack of diphtheria was practically nil. Certain bacteriologists believe that diphtheria antitoxin is found in about 83 per cent. of normal adults.

Rolleston,¹ inspired by the report of Coulter's case, states that he has made observations on 1600 cases of diphtheria. By "relapse" he means the reappearance of the disease after recovery from the initial attack, but before the discharge of the patient from the hospital. The term "second attack" is applied to cases in which the two illnesses did not occur during a single period of detention in the hospital. In the 1600 cases, 27, or 1.6 per cent., had relapses, which were separated from the initial angina by intervals ranging from three to fourteen weeks. Two of the 27 had palatal and ocular palsies after the primary attack, but none showed any signs of paralysis after the relapse. Thirty-six, or 2.2 per cent., had second attacks, between which and the first there were intervals ranging from three months to fourteen years. One of the patients had paralysis during the first attack only, and 3 had paralysis during the second illness, who had previously escaped any nervous sequelæ. In only one case were both attacks followed by paralysis.

Rolleston believes that the early administration of antitoxin helps to prevent paralysis, especially of a severe character. He also believes that the frequency and severity of diphtheritic paralysis bear a direct relation to the initial angina. Diphtheritic palsy is now more frequent because more persons are saved by antitoxin, but there is no doubt that the frequency of paralysis and the mortality could be considerably reduced by the early administration of antitoxin.

Sciatica. The distinctions between neuralgia and neuritis are not sharp, and this statement applies with special force to sciatica. Petrén² states that he fully agrees with the opinion, held by many, that marked symptoms of sciatica cannot be explained as neuralgia, but must be attributed to a real anatomical inflammation. He refers to cases characterized by a group of symptoms otherwise corresponding to those found in sciatica, but with tenderness upon pressure only over the gluteus medius, not over any point of the nerve. The occurrence of such cases, he states, has remained unnoticed in the literature, and yet it seems to me hardly possible that this form has escaped the notice of neurologists, even though it may not have been described, and while I can recall no particular case, I feel confident that I have seen it. Petrén believes myositis of the gluteus medius is the cause of this circumscribed pain, or that the resistance upon palpation over this muscle may be caused by a localized muscular defence on account of tenderness from inflammation of the nerve twigs supplying the muscle.

As regards *treatment* of sciatica, Petrén advises uninterrupted rest in bed for at least two weeks, but complete immobilization of the limb

¹ Journal of Nervous and Mental Disease, March, 1910, p. 164.

² Review of Neurology and Psychiatry, May, 1909, p. 305.

he thinks is unnecessary. He uses salicylates in all cases, and he favors aspirin in large doses, with external applications of salicylates (such as mesotan, unguentum salenæ, salite, spirosal). Treatment with drugs other than salicylates he thinks unnecessary in acute sciatica. Narcotics of any kind may almost always be omitted. Massage is important, and he thinks may be employed with the greatest benefit in subacute as well as acute sciatica. In the most severe cases, it seems advisable to wait for a time before commencing massage, but not beyond a week, and he does not recommend too vigorous massage. Vibrations may also be employed. Bloodless nerve stretching he believes to be very useful. The best and simplest method is to place the patient on his back, and then to raise the leg with the knee straight until a very moderate degree of pain is felt along the sciatic nerve. When this is repeated daily, it usually very soon becomes evident that the foot can be raised gradually higher and higher. If the treatment be carried out carefully it may be commenced while the symptoms are somewhat severe, but it should not be begun at once in very severe cases, and when pain increases, it should be discontinued for a time. Hot baths are useful, preferably steam baths, steam or hot-air cabinets. A hot-air bath can be made by putting a few electric lamps under the bed-covers. He uses electricity only in cases which have shown a tendency to become chronic, and prefers the faradic current.

Petrén believes that Lasègue's sign in sciatica and Kernig's sign in meningitis are one and the same phenomenon. It has seemed to me doubtful whether the inability to extend the leg in Kernig's sign can be explained as a result of the pain, as it may be obtained in unconsciousness, but it is undoubtedly a result of pain in Lasègue's sign and is largely voluntary.

Gara, in 1907, described a new sign of sciatica, viz., tenderness to pressure over the spinous process of the fifth lumbar vertebra. Raimist¹ has made further investigations on 75 cases of sciatica, and has found the tenderness of the fifth lumbar spinous process in all when pressure was made from the side of the sciatica. He found tenderness of the fourth lumbar spinous process in 51 cases, of the third, fourth, and fifth lumbar spinous processes in 13 cases, and of the first two sacral vertebrae in 9 cases.

Influence of Thyroid Gland upon Nerves. Some important investigations have been made by F. K. Walter² as regards the influence of the thyroid gland upon the nerves. He has shown that complete removal of this gland in rabbits has so great an effect upon degeneration and regeneration of the peripheral medullated nerves that two months after compression of a nerve almost no new medullated fibers are found at the seat of compression. If small portions of the thyroid gland, provided they are not

¹ *Neurologisches Centralblatt*, October 16, 1909, p. 1087.

² *Deutsche Zeitschrift f. Nervenheilkunde*, vol. xxxviii, Nos. 1 and 2, p. 1.

very minute, are left, this delay in degeneration and regeneration does not occur. The delayed regeneration is not the result of general metabolic disturbances or of cachexia strumipriva, as it is independent of these conditions. The thyroid gland must be assumed to have some specific influence upon degeneration and regeneration of nerves, including the nerve cells and the cells of the sheaths of Schwann. Degeneration and regeneration of nerves occur in almost or fully normal manner when thyroid tablets are fed to rabbits whose thyroid glands have been removed, but thyroid tablets have no effect upon these processes in normal rabbits. The parathyroid glands have not the influence upon degeneration and regeneration of nerves that the thyroid gland has, and, if they are entirely removed, death from tetany occurs in a few days. The hypophysis increases in size, even to several times the normal size, in rabbits whose thyroid glands have been removed.

It would be interesting to observe, in view of these studies, whether the nerves in myxedematous persons are in any way different, as regards degeneration and regeneration, from those in normal persons.

MISCELLANEOUS NERVOUS DISEASES.

Hysteria. The influences of hysteria upon the reflexes is a question which is still calling forth much discussion, since Babinski stated that hysteria is incapable of modifying the tendon reflexes. Knapp¹ has investigated this matter, and, after examination of many cases, states that the results of his experience are in harmony with the opinions formerly expressed by other writers. The results seem to contradict the claim of Babinski. An alteration of the reflexes in hysteria is too common to warrant any attempt to explain it away, as Babinski has tried to do, by asserting that it is no more common than in non-hysterical persons, or that it is due to some co-existing condition, or to errors in observation or in diagnosis.

Loss of tendon reflexes as a sign of hysteria seems to be possible, if we may judge from a few cases reported in the literature, but one must be exceedingly careful in accepting such loss as hysterical in origin. Wohlwill² has observed a case in which the *loss of the Achilles and patellar reflexes* seemed to be from functional cause. Examination of the cerebrospinal fluid for cellular elements and globulin reaction was negative. The tendon reflexes were absent in some examinations and present in others. Hypotonia of the muscles was pronounced. Hypotonia is not always present when the tendon reflexes are diminished. Thus, Wohlwill mentions that he had examined 2 cases of multiple sclerosis, and the tendon reflexes were exaggerated notwithstanding the hypotonia.

¹ Journal of Nervous and Mental Disease, February, 1910, p. 93.

² Neurologisches Centralblatt, June 1, 1909, p. 567.

He believes he has contributed another case to those showing a functional loss of tendon reflexes.

Intestinal and Vesical Crises in Neurasthenia. Intestinal and vesical crises, not as signs of tabes, are described by v. Bechterew,¹ and a little literature upon the subject is referred to by him. One of his patients was a neurotic woman, who had had intestinal crises for ten years. These crises would occur at most inopportune moments, as when she came to the hotel table or entered a theatre; and they became more troublesome when opportunity for evacuation of the rectum was not afforded. For a time she had attempted vainly to control the attacks by taking little food. She had been obliged, after ringing the front door-bell, with the purpose of paying a visit, to return at once to her home. The attack occurred on one occasion when she was in a burning building. If she attempted to control the impulse, the abdomen would become distended and the rumbling in the intestines was most mortifying. When she had full opportunity for gratifying the desire, the attack was not likely to occur.

Such cases are more common in neuropathic individuals who have previously had intestinal disturbance. The vesical crises occasionally occur in association with the intestinal crises, but usually are alone. Both disturbances are found in true neurasthenia, according to v. Bechterew, but I think one may well question the correctness of the diagnosis of neurasthenia. Such phobias hardly belong to neurasthenia, and might be classed under psychasthenia. V. Bechterew has found bromide and codein, with the tinctures of valerian and strophanthus, warm baths, and psychotherapy in mild hypnosis of service.

Epilepsy. Ulrich² has employed ordinary salt (chloride of sodium) in the treatment of all his cases of bromide poisoning, continuing 5 grams of bromide of sodium daily, with 2 grams of salt three times daily. The food was not salted. Symptoms of bromide intoxication disappeared a few days after the administration of salt. Washing out the mouth with 1 per cent. saline solution removed the dryness and fetor *ex ore*. Compresses with 10 per cent. saline solution healed obstinate acne, but he does not maintain that salt will cure every bromide rash. Salt, in his experience, is the antidote for bromide intoxication.

In cases of epilepsy in which the attacks had become very infrequent after the administration of bromide with a salt-free diet, he was able with 20 to 30 gm. of salt to produce a convulsion. This test he considers valuable for diagnostic and therapeutic purposes. Where the mental condition might be benefited by an epileptic discharge, the convulsion following the administration of salt has been of benefit.

Laudenheimer³ has studied the urine of epileptic patients under the influence of bromide. He has found the same beneficial results from

¹ Neurologisches Centralblatt, June 1, 1909, p. 562.

² Ibid., January 16, 1910, p. 74.

³ Ibid., May 1, 1910, p. 461.

the administration of sodium chloride in bromism as has Ulrich—indeed, his observations preceded those of Ulrich. A study of the urine showed that before the administration of sodium chloride less than half the bromide administered was eliminated, but after the administration of the sodium chloride the bromide eliminated exceeded greatly that administered, as bromide had been retained within the body, and this result was obtained even as long as two days after the administration of sodium chloride was stopped. The beneficial results of sodium chloride in bromism are, therefore, in part, caused by the elimination of the bromide, but only in part. In some chronic cases, where the sodium chloride of the blood has not been diminished, but the heart and kidneys are insufficient for normal elimination, an increase in the diuresis, as by digitalis, overcomes the bromism. Laudenheimer has found that bromism may develop rapidly in young anemic persons whose blood contains a small amount of sodium chloride. Sodium chloride has not the same effect upon the elimination of bromipin as on a bromide salt. Mild symptoms of bromism are frequent, such as disturbance of power of concentration, loss of appetite, alteration of gait, and rapidly developing acne. In sodium chloride we possess a quickly acting remedy, and 3 to 5 gm. daily may be sufficient to ward off these symptoms, especially in anemic individuals. It is well to remember that, from these investigations, the danger of bromism in epilepsy is increased by a salt-free diet.

Spasms of Soft Palate. Clonic spasms of the soft palate are of rare occurrence, especially when they produce noises perceptible to the patient. Schlesinger¹ reports the case of a woman, aged fifty years, who, during five years, had had noises in her head, occurring rarely at first, but finally becoming continuous. They were at times associated with headache, and could be heard by others at the distance of one meter, and were like the ticking of a watch. No other symptoms were present. No satisfactory explanation was obtained.

Sweat Reflex. This reflex is possibly more common than familiar. F. C. Busch² speaks of its occurrence in 3 cases. The sweating was confined to certain definite facial areas and followed rather quickly the ingestion, or even smelling, of certain pungent articles of diet. The reflex involved apparently included, on the afferent side, the olfactory nerves and possibly the gustatory; and on the efferent side, the secretory fibers of the sweat glands of the face distributed with the seventh cranial nerve. Busch could not determine why the sweating should be so sharply localized and invariably confined to the same areas, or why only certain stimuli in any given case should cause this reflex. Heredity is a factor, and in one family reported by Busch, the condition appeared in one or more members during four generations, and in two other families it was traced through two generations. In all instances,

¹ Weiner med. Wochenschrift, 1909, No. 22.

² Journal of the American Medical Association, July 17, 1909.

the affected individuals were of a nervous type and had a sensitive skin, and sensitive mucous membrane. In the first case reported, perspiration of the face followed ingestion of tomatoes, strong cheese, roast beef, and pickles. Perspiration would develop on the face in one or two minutes after eating tomatoes. In the second case, perspiration of the infraorbital region followed ingestion of onions; and in the third, the eyes, forehead, and upper lip were covered by profuse perspiration after the use of pungent or peppery foods, acids and condiments. The condition did not appear in any of Busch's cases before puberty. I can recall a case in which the ingestion of pepper rapidly caused perspiration to appear on the top of the head, which was bald.

Muscular Dystrophy. Batten¹ attempts to include congenital myohypotonia (myotonia) under the muscular dystrophies. To the objections (1) that the myopathies are conspicuously familial diseases, whereas no familial tendency has been recorded in myotonia; and (2) that the several types of myopathy often show familial relationship one with another, whereas no case of myotonia has been reported in the myopathic family, he makes the following statement:

Evidence is accumulating to show that typical cases of myotonia do occur rarely as a family disease. Sylvestri has recorded 2 cases in one family, the first and fifth children, the second and third being healthy. A maternal aunt had myopathy. The elder child at the age of sixteen is said to have presented a typical picture of Erb's juvenile form of dystrophy. Finkelnburg has recorded a family in which three members were affected. Batten observed 2 cases of myotonia in the same family.

Another objection is that myotonia is present at birth, and muscular dystrophy is not. It is, however, a well-known fact that the facial weakness of myopathy may be a striking feature in early infancy.

It has not been satisfactorily determined that either dystrophy or myotonia commences acutely. Marked flaccidity is present in many cases of myopathy, and localized wasting is by no means always present; so that flaccidity and absence of atrophy do not make myotonia a distinct disease. There has never been a case of recovery from myotonia, and return of the knee-jerk in myopathy has been recorded by Jendrassik. Batten, after answering these various objections, makes myotonia congenita the simple atrophic type of dystrophy. He includes two other types under dystrophy, viz., the distal type of myopathy, and myotonia atrophica.

He discusses the interesting question as to whether recovery ever occurs in muscular dystrophy, and refers to the cases reported by Marina, Erb, Jendrassik, and a few others. There is little doubt that some cases of myopathy become arrested, and Batten acknowledges that even recovery is possible, and he refers to Erb's interesting statement: "I have

¹ Quarterly Journal of Medicine, April, 1910, p. 313.

formerly, in a wide experience of such cases, never seen recovery take place and did not consider it possible, but this case has taught me otherwise."

Myohypotonia Congenita. This disease needs further study before its individuality can be fully accepted. Described by Oppenheim, in 1900, only a few cases with complete necropsy have been recorded since then. In a case reported by Reyher and Helmholtz, only the muscular system was examined. The symptoms of the disease are: congenital hypotonia of the muscles, loss of tendon reflexes, and diminished or abolished electrical irritability; without disturbance of sensation or atrophy, and occasionally with improvement. All investigators who have examined the muscles have found them diseased, but, as regards the central nervous system, Spiller found no noteworthy alteration of the nerve cells of the anterior horns, Baudoin found moderate cellular changes, while Rothmann¹ found intense alteration of these cells.

Myohypotonia congenita resembles, in many respects, the early infantile spinal muscular atrophy of Werdnig and Hoffmann, and Rothmann's discussion of this relation is much to the point. In the Werdnig-Hoffmann type, heredity, progression of the disease, and the reaction of degeneration are important, and yet cases are recorded in which heredity has played no part, and a few cases, questionable they may be, of myohypotonia are on record with a family tendency to the disease. Too much stress cannot be laid upon the congenital manifestation of the latter affection. The tendency to improvement in one disease, to a fatal termination in the other, or the difference in the electrical irritability, is not a sufficient diagnostic criterion. Rothmann concludes that both the Werdnig-Hoffmann type and the myohypotonia congenita should be included under the designation of early infantile spinal muscular atrophy, although he does not regard them as identical. There is also a relation between myohypotonia congenita with implication of the lower cranial nerves, and the agnesia of the nuclei of cranial nerves described by Möbius.

The case reported by Lereboullet and Baudouin² presented the congenital flaccid paralysis, with intense implication of the muscles of the neck. This is unusual. The microscopic examination showed changes confined to the muscles; the nervous system was normal. The findings are in conformity with those of my case, which was the first with necropsy. Other investigations seem to show, however, that the nerve cells of the anterior horns in the spinal cord may be affected.

One of the most thorough studies of this disease is made by Haberman,³ who gives the clinical histories of 3 cases from Oppenheim's

¹ Monatschrift f. Psychiatrie und Neurologie, vol. xxv, 1909, p. 161.

² Bulletins et Mémoires de la Société Médicale des Hôpitaux de Paris, No. 20, June 10, 1909, p. 1162.

³ American Journal of the Medical Sciences, March, 1910, p. 383.

service. He discusses very fully the cases which have been reported, especially the few with necropsy, and considers also the differential diagnosis. The disease possibly might be confused after insufficient study with infantile or congenital myxedema, Mongolianism, rickets, "inhibition paralyses" of Vierordt (pseudoparalysis due to pain), poliomyelitis, poliomyelitis, motor nuclear aplasia (*Infantiler Kernschwund* of Möbius), muscular dystrophy, and "early infantile spinal progressive muscle atrophy" (Werdnig and Hoffmann). Space does not permit further reference to Haberman's interesting consideration of all these disorders in their resemblance to myotonia congenita.

He states that the few autopsy examinations which have been made lead us to believe the muscle changes to be secondary, not, however, to degenerative changes in the ganglion cells of the anterior horns, but to a retarded development of these, or to a congenitally enfeebled or enervated condition. Myotonia congenita is a clinical entity, in its typical form a sharply defined syndrome differentiable from all the heretofore known myopathies and spinal atrophies.

Collier and Holmes¹ report the study of 2 cases of this disease. In one, they obtained pieces of muscle, in the other a complete necropsy. Their findings were alterations in the muscles like those of muscular dystrophy, smallness of the anterior roots, especially in the lumbosacral region, diminution in number of the cells of the anterior horns, and atrophy of these cells.

Thomsen's Disease. Myotonia (Thomsen's disease) is sometimes associated with muscular atrophy. Steinert² has made a study of a number of cases of this kind, and concludes that amyotrophic myotonia gives a typical symptom-complex, sharply defined clinically, and that the muscular dystrophy is of a form peculiar to Thomsen's disease. The muscles of the forearm and hand of one or both sides are first affected, and when only one limb is affected it is usually the right. The atrophy may be confined to these parts for years; then follows the facies myopathica, and occasionally atrophy of other muscles of the arms and shoulders, especially the deltoids and sternocleidomastoid muscles. The atrophy may finally extend to all the muscles of the body. Impotence, with atrophy of the testicles, is relatively common.

Steinert has had one case with necropsy, the second of the kind in the literature. He finds the pathology of Thomsen's disease to consist of extensive cirrhosis of the muscles and degeneration of the posterior columns like that of tabes, and the latter he regards as an essential part of the disease.

Myotonia Atrophica. Under this term is described a group of cases in which muscular atrophy is associated with slow relaxation of the muscles after voluntary contraction. Batten and Gibb³ believe the

¹ Brain, vol. xxxii, 1909, p. 269.

² Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxvii, Nos. 1 and 2, p. 58.

³ Brain, 1909, Part 126, vol. xxxii.

muscular atrophy has a peculiar distribution, not corresponding to any of the well-known types of myopathy. The characteristic features are weakness of the facial muscles (myopathic face), atrophy of the sternomastoids, atrophy of the vasti of the thighs and dorsiflexors of the feet, and a slow relaxation of certain muscles after contraction. The more forcible the contraction the slower the relaxation. Variations from this type have been described.

Various names have been given to the disorder, but Batten and Gibb prefer the one selected by Rossolimo, *myotonia atrophica*, and they report 5 cases. They collected 29 cases from the literature; 3 of these presented symptoms suggesting a complicating lesion and are discarded by them. Of the remaining 27 cases, 15 presented a distribution closely approximating that which they described, but in the remaining 12 the atrophy differed so widely from the distribution in their own cases that they rejected them.

The disease may occur in more than one member of a family, but direct heredity has not been traced in any case. It is much more common in males. The symptoms appear in early adult life.

Whether this disorder can be regarded as a distinct disease remains to be seen, and it is certainly remarkable that 12 out of 27 cases were atypical. It is also to be remembered that syringomyelia has been described with slow relaxation of contracted muscles.

A new case of atrophic myotonia in addition to that mentioned above is reported by Steinert.¹ In addition to much muscular atrophy the patient had ptosis, monotonous high voice, loss of hair, and vasomotor symptoms in the hands; symptoms which Steinert has shown are common in advanced cases of atrophic myotonia. The only very striking sign of myotonia was the mechanical myotonic reaction of the tongue.

Paralysis Agitans. An interesting form of ocular palsy in paralysis agitans is described by G. Markeloff.² Both orbicular muscles were affected, the eyes were kept closed, and could not be opened by any effort, unless the upper lid of one eye was raised by the finger, when both eyes suddenly opened.

Tetanus. In a case of head tetanus studied by Orzechowski,³ failure of the light reaction of the pupils was present, with preservation of the convergence reaction. The author compares this condition with the cases of tetanus in which paralysis of other cranial nerves than the seventh was found, and believes that such symptoms cannot be attributed to exhaustion, as some writers teach.

Rabies. The first American cases of spinal cord lesion following the Pasteur treatment have been reported by W. A. Jones.⁴ According to

¹ Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxix, Nos. 1 and 2, p. 168.

² Neurologisches Centralblatt, November 16, 1909, p. 1202.

³ Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxvii, Nos. 1 and 2, p. 1.

⁴ Journal of the American Medical Association, November 13, 1909, p. 1626.

his statements, the exact nature of the pathogenesis is unknown. A fatal result is rare, only 2 deaths have occurred in the 62 collected cases. Only 1 necropsy has been obtained, and the results of this were uncertain, because of a secondary infection of a different type. The symptoms follow the use of the antirabic serum, and occur independently of rabic or ordinary septic infection. They resemble those of Landry's paralysis or severe multiple neuritis, and the initial symptoms appear in that region of the body where the inoculation is given, and later extend to other parts, indicating that the poisonous material, as in the rabic infection, follows along the nerve trunks until it reaches the spinal cord, where a myelitis is probably set up. In the favorable prognosis the cases are different to those of Landry's paralysis.

Jones reports 2 cases studied by him, and gives the brief notes of a case studied by Thayer.

Disturbances of Sensation. In various forms of organic disease of the spinal cord, tabes, syringomyelia, tumor, etc., a greater disturbance of sensation in the distal portions of the limbs has been observed. Often the anesthesia persists here when it has disappeared from the proximal portions of the limbs. Gerhardt¹ discusses this subject in an interesting paper. The law of the eccentric position of the long fibers in the cord, as given by Flatau, does not explain the phenomenon. According to this law, those fibers which enter lower in the cord take a more peripheral position. This law affords an explanation of the greater anesthesia in the peripheral parts of the lower limbs, but does not explain the recovery of sensation in the perineal region, from which the fibers enter the cord below those from the feet.

The theory of Kohnstamm is unsatisfactory, viz., that the crossed ascending tracts re-enter the gray matter of the cord. Equally unsatisfactory is the metamerie theory, according to which a distinct part of a limb, as the hand or forearm, is represented in a segment of the cord. No anatomical explanation seems to explain the phenomenon under discussion.

Gerhardt believes that the sensory fibers from distal portions are more easily affected than sensory fibers from central portions of the limbs, as in lesions of peripheral nerves, motor fibers are more affected than sensory. Edinger's exhaustion theory may also be of assistance, as the peripheral fibers are more employed than the central, and therefore more likely to undergo alteration.

¹ Deutsches Archiv f. klin. Med., vol. xcviii, Nos. 1 to 3, p. 1.

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